DOCUMENT RESUME

ED 382 159 IR 017 090

AUTHOR Schlosser, Charles A.; Anderson, Mary L.
TITLE Distance Education: Review of the Literature.
INSTITUTION Iowa Distance Education Alliance, Ames.; Iowa State Univ. of Science and Technology, Ames. Research Inst. for Studies in Education.
SPONS AGENCY Department of Education, Washington, DC.
REPORT NO ISBN-0-89240-071-4
PUB DATE Jan 94
CONTRACT R203-B-20001-93
NOTE 71p.
AVAILABLE FROM AECT Publication Sales, 1025 Vermont Ave., N.W., Ste. 820, Washington, DC 20005-3547.
PUB TYPE Information Analyses (070)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Background; Communication (Thought Transfer); *Distance Education; Educational Administration; *Educational Research; *Educational Theories; Elementary Secondary Education; Instructional Development; Interaction; *Literature Reviews; Nontraditional Education; Program Evaluation; School Personnel

ABSTRACT

This document provides an overview of the current literature on distance education. A historical perspective and definitions associated with distance education are presented in the first section. The following theories are also discussed: independence and autonomy; industrialization of teaching; and interaction and communication. A synthesis of existing theories and a theoretical framework for distance education is also offered. A review of the research on distance students and distance education systems is highlighted in the second section. Operational issues are examined in the third section: management and administration; personnel; programming; and facilities. Summaries and references are included at the end of each section. Contains 357 references. (AEF)

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CE EDUCATION: Review of the Literature

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Distance Education: Review of the Literature

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January, 1994

U.S. Department of Education's Star Schools Program

PUBLISHED FEBRUARY 1994 BY
Association for Educational Communications and Technology
1025 Vermont Ave., NW, Suite 820
Washington, DC 20005-3547
Voice: 202-347-7834
Fax: 202-347-7839

Printed in the United States of America

ISBN 0-89240-071-4

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This monograph was written for the research group of the Iowa Distance Education Alliance, Michael R. Simonson, Coordinator, and was funded in part by U.S. Department of Education Star Schools grant #R203 B 20001-93.

Preface

Distance Education: A Review of the Literature: was written with the teacher, trainer, graduate student, professor, and media specialist in mind. It provides a brief, yet comprehensive overview of the currently available literature on distance education. In addition to providing a historical perspective of distance education and comprehensive summaries of the major theories and definitions associated with this discipline, *Distance Education: A Review of the Literature* examines the current operational issues inherent in distance education enterprises. Most important, this publication contains summaries of a cross section of all research dealing with distance education, not merely the positive literature. Specifically, this book includes:

- a definition of distance education;
- the major distance education theories espoused by recognized leaders in the field;
- an overview of the history of distance education;
- an overview of current operational issues concerning the management and administration, personnel, programming, and facilities of distance education enterprises;
- and a selected bibliography of distance education literature.

Distance Education: A Review of the Literature is an essential reference for those who want an overview of the literature related to distance education.

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Iowa State University
Ames, Iowa
1994

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Distance Education-- Definition, History and Theory

What is Distance Education?

It is the nature of questions that they are easier to ask than to answer. This is true of the question, "what is distance education?" for at least two main reasons. First, "distance" has multiple meanings. Second, the term, "distance education," has been applied to a tremendous variety of programs serving numerous audiences via a wide variety of media.

To Rudolf Manfred Delling,

> Distance education (Fernunterricht) is a planned and systematic activity which comprises the choice, didactic preparation and presentation of teaching materials as well as the supervision and support of student learning and which is achieved by bridging the physical distance between student and teacher by means of at least one appropriate technical medium (in Keegan, 1986, p. 58).

For Hilary Perraton, (1988) distance education is "an educational process in which a significant proportion of the teaching is conducted by someone removed in space and/or time from the learner" (p. 34).

The U.S. Department of Education's Office of Educational Research and Improvement (in Bruder, 1989) defines distance education as "the application of telecommunications and electronic devices which enable students and learners to receive instruction that originates from some distant location" (p. 30). Typically, the learner is given the capacity to interact with the instructor or program directly, and given the opportunity to meet with the instructor on a periodic basis.

Greville Rumble (1989) offered the following five-part definition of distance education:

- In any distance education process there must be: a teacher; one or more students; a course or curriculum that the teacher is capable of teaching and the student is trying to learn; and a contract, implicit or explicit, between the student and the teacher or the institution employing the teacher, which acknowledges their respective teaching-learning roles.

- Distance education is a method of education in which the learner is physically separate from the teacher. It may be used on its own, or in conjunction with other forms of education, including face-to-face.

- In distance education learners are physically separated from the institution that sponsors the instruction.

- The teaching/learning contract requires that the student be taught, assessed, given guidance and, where appropriate, prepared for examinations that may or may not be conducted by the institution. This must be accomplished by two-way communication. Learning may be undertaken either individually or in groups; in either case it is accomplished in the physical absence of the teacher (p. 19).

For Desmond Keegan, (1988a) the following four definitions were central to an attempt to identify the elements of a single, unifying definition of distance education:

1. The French government, as part of a law passed in 1971, defined distance education as

   > ...education which either does not imply the physical presence of the teacher appointed to dispense it in the place where it is received or in which the teacher is present only on occasion or for selected tasks. (p. 6)

2. Börje Holmberg noted that distance education

   > ...covers the various forms of study at all levels which are not under the continuous, immediate supervision of tutors present with their students in lecture rooms or on the same premises but which, nevertheless, benefit from the planning, guidance and teaching of a supporting organization. (p. 6)

3. In defining distance education, Otto Peters emphasized the role of technology:

> Distance teaching/education (Fernunterricht) is a method of imparting knowledge, skills and attitudes which is rationalized by the application of division of labor and organizational principles as well as by the extensive use of technical media, especially for the purpose of reproducing high quality teaching material which makes it possible to instruct great numbers of students at the same time wherever they live. It is an industrialized form of teaching and learning. (p. 6)

4. For Michael Moore, the related concept of "distance teaching" was defined as

> ...the family of instructional methods in which the teaching behaviors are executed apart from the learning behaviors, including those that in a contiguous situation would be performed in the learner's presence, so that communication between the teacher and the learner must be facilitated by print, electronic, mechanical or other devices. (p. 6)

Keegan (1988a) identified six main elements of these definitions, using them to compose a definition of distance education:

- the separation of teacher and learner, which distinguishes it from face-to-face lecturing
- the influence of an educational organization, which distinguishes it from private study
- the use of technical media, usually print, to unite teacher and learner and carry the educational content
- the provision of two-way communication, so that the student may benefit from or even initiate dialogue
- the possibility of occasional meetings for both didactic and socialization purposes
- the participation in an industrialized form of education which, if accepted, contains the genus of radical separation of distance education from other forms. (p. 30)

Garrison and Shale (1987) argued that, in light of advances in distance education delivery technologies, Keegan's definition was too narrow, and did not "correspond to the existing reality as well as to future possibilities" (p. 13). While declining to offer a definition of distance education, Garrison and Shale offered the following three criteria they regarded as "essential for characterizing the distance education process" (p. 11):

1. Distance education implies that the majority of educational communication between (among) teacher and student(s) occurs noncontiguously.

2. Distance education must involve two-way communication between (among) teacher and student(s) for the purpose of facilitating and supporting the educational process.

3. Distance education uses technology to mediate the necessary two-way communication. (p. 11)

The History of Distance Education

The roots of distance education are at least 150 years old. An advertisement in a Swedish newspaper in 1833 touted the opportunity to study "Composition through the medium of the Post" (Holmberg, 1986, p. 6).

In 1840, England's newly-established penny post allowed Isaac Pittman to offer shorthand instruction via correspondence. Three years later, instruction was formalized with the founding of the Phonographic Correspondence Society, precursor of Sir Isaac Pitman Correspondence Colleges (Holmberg, 1986).

Distance education, in the form of correspondence study, was established in Germany by Charles Toussaint and Gustav Langenscheidt, who taught language in Berlin. Correspondence study crossed the Atlantic in 1873, with the founding, by Anna Eliot Ticknor, of a Boston-based society to encourage study at home. The Society to Encourage Studies at Home attracted more

than 10,000 students in 24 years (Watkins, 1991). Students of the classical curriculum (mostly women) corresponded monthly with teachers, who offered guided readings and frequent tests.

From 1883-1891, academic degrees were authorized by the state of New York through the Chautauqua College of Liberal Arts to students who completed the required summer institutes and correspondence courses. William Rainey Harper, the Yale professor who headed the program, was effusive in his support of correspondence study, and confident in the future viability of the new educational form:

> The student who has prepared a certain number of lessons in the correspondence school knows more of the subject treated in those lessons, and knows it better, than the student who has covered the same ground in the classroom.
>
> The day is coming when the work done by correspondence will be greater in amount than that done in the class-rooms of our academics and colleges; when the students who shall recite by correspondence will far outnumber those who make oral recitations. (Watkins, p. 4)

In 1891, Thomas J. Foster, editor of *The Mining Herald*, a daily newspaper in eastern Pennsylvania, began offering a correspondence course in mining and the prevention of mine accidents. His business developed into the International Correspondence Schools, a commercial school whose enrollment exploded in the first two decades of the century, from 225,000 in 1900 to more than 2,000,000 in 1920 (Rose, 1991).

In 1886, H. S. Hermod, of Sweden, began teaching English by correspondence. In 1898 he founded Hermod's, which would become one of the world's largest and most influential distance-teaching organizations (Holmberg, 1986).

Correspondence study continued to develop in Britain with the founding of a number of correspondence institutions, such as Skerry's College, in Edinburgh, in 1878, and University Correspondence College, in London, in 1887. At the same time, the university extension movement in the United States and England promoted the correspondence method. Among the pioneers in the field were Illinois Wesleyan, in 1877, and the University Extension Department of the University of Chicago, in 1892 (Holmberg, 1986).

Illinois Wesleyan offered bachelor's, master's and doctoral degrees as part of a program modeled on the Oxford, Cambridge, and London model. Between 1881 and 1890, 750 students were enrolled, and in 1900, there were nearly 500 students seeking degrees. However, concerns about the quality of the program prompted a recommendation that it be terminated by 1906 (Watkins).

Correspondence study was integral to the University of Chicago. The school, founded in 1890 and opened two years later, had as one of its five divisions University Extension, the first such division in an American university. The extension division was divided into five departments: lecture study, class study, correspondence teaching, library, and training (Watkins).

The correspondence study department of the University of Chicago was successful, at least in terms of numbers. Each year, 125 instructors taught 3,000 students enrolled in 350 courses. Nevertheless, enthusiasm within the university for the program waned, partly for financial reasons (Watkins).

At the University of Wisconsin, the development of the "short course" and farmers' institutes in 1885 formed the foundation for university extension. Six years later, the university announced a program of correspondence study led by the eminent historian, Frederick Jackson Turner. However, as at the University of Chicago, faculty interest waned. Further, public response was minimal, and the correspondence study program was discontinued in 1899 (Watkins). Correspondence study would have to wait another seven years to be reborn under a

new, stronger, Correspondence Study Department within the school's University Extension Division.

Distance education began to enrich the secondary school curriculum in the 1920s. Benton Harbor, Michigan students were offered vocational courses in 1923, and six years later, the University of Nebraska began experimenting with correspondence courses in high schools (Holmberg, 1986).

In France, the Ministry of Education set up a government correspondence college, in response to the impending war. Although the Centre National d'Eseignment par Correspondences was established for the education of children, it has since become a huge distance-teaching organization for adult education (Holmberg, 1986).

The original target groups of distance education efforts were adults with occupational, social and family commitments. This remains the primary target group today. Distance education provided the opportunity to widen intellectual horizons, as well as the chance to improve and update professional knowledge. Further, it stressed individuality of learning, and flexibility in both the time and place of study.

Two philosophies of distance education became identifiable. The full liberalism of programs offered by Hermod's, in Sweden, emphasized the free pacing of progress through the program by the student. Other programs, such as those offered by the University of Chicago, offered a more rigid schedule of weekly lessons (Holmberg, 1986).

In Europe, there was steady expansion of distance education. without radical changes in structure, but with gradually more sophisticated methods and media employed. Audio recordings were used in instruction for the blind, and in language teaching for all students. Laboratory kits were used in such subjects as electronics and radio engineering. Virtually all large-scale distance teaching organizations were private correspondence schools (Holmberg, 1986).

In the United States, advances in electronic communications technology helped determine the dominant medium of distance education. In the 1920s, at least 176 radio stations were constructed at educational institutions, although most were gone by the end of the decade. The surviving stations were mostly at land grant colleges, which were committed to independent study (Buckland & Dye, 1991).

In the early 1930s, experimental television teaching programs were produced at the University of Iowa, Purdue University, and Kansas State College. However, it was not until the 1950s that college credit courses were offered via broadcast television: Western Reserve University was the first to offer a continuous series of such courses, beginning in 1951 (Buckland & Dye). Sunrise Semester was a well-known televised series of college courses offered by New York University on CBS from 1957 to 1982 (Buckland & Dye).

Satellite technology, developed in the 1960s, and made cost-effective in the 1980s, enabled the rapid spread of instructional television. Federally funded experiments, such as the Appalachian Education Satellite Project (1974-75) in the United States and Canada demonstrated the feasibility of satellite-delivered instruction. However, these early experiments were loudly criticized for being poorly planned (Albright, 1988). More recent attempts at satellite-delivered distance education have been more successful. The first state educational satellite system, Learn/Alaska, was created in 1980. It offered six hours of instructional television daily to 100 villages, some of them accessible only by air (Johnson, 1988). The privately-operated TI-IN Network, of San Antonio, Texas, has delivered a wide variety of courses via satellite to high schools across the United States since 1985.

The 1962 decision that the University of South Africa would become a distance teaching university brought about a fundamental change in the way distance education was practiced in much of the world. Another landmark was the founding, in 1971, of the Open University of the United

Kingdom, a degree-giving distance teaching university offering full degree programs, sophisticated courses, and the innovative use of media (Holmberg, 1986). The Open University brought heightened prestige to distance education, and spurred the establishment of similar institutions in industrial nations, such as West Germany, Japan, and Canada, as well as such lesser-developed nations as Sri Lanka and Pakistan (Holmberg, 1986).

While the distance-teaching universities shared numerous similarities, they were not identical in their mission or practice. Two of the largest and most influential, the Open University of the United Kingdom and the German FernUniversität, differ widely. The British school favors employed, part-time students of above normal study age, and allows them to enroll without formal entrance qualifications. By 1984, some 69,000 of its students had completed work for the Bachelor of Arts degree (Holmberg, 1986).

The German FernUniversität, founded in 1975, offers a more rigorous program than its British counterpart. Despite strict, formal entrance requirements, it had 28,000 students in 1985. However, the dropout rate is very high, and in its first decade, had only 500 students complete the full curricula for a university degree (Holmberg, 1986).

Holmberg (1986) cites numerous reasons for the founding of distance-teaching universities, including:

- the need felt in many countries to increase the offerings of university education generally
- a realization that adults with jobs, family and social commitments contributed a large group of prospective part-time university students
- a wish to serve both individuals and society by offering study opportunities to adults, among them disadvantaged groups
- the need found in many professions for further training at an advanced level
- a wish to support educational innovation
- a belief in the feasibility of an economical use of educational resources by mediated teaching (p. 30)

Theory and Distance Education

Although forms of distance education have been in existence since the 1840s and attempts at theoretical explanations of distance education had been undertaken by leading scholars in the field, the need for a theory base of distance education was still largely unfulfilled in the 1970s. Holmberg (1986) stated that "further theoretical considerations will contribute results of a kind to give to distance educators a firmly based theory, a touchstone against which decisions can be taken with confidence" (p. 132). In 1988, Holmberg continued to recognize the need as he stated,

> One consequence of such understanding and explanation will be that hypotheses can be developed and submitted to falsification attempts. This will lead to insights telling us what in distance education is to be expected under what conditions and circumstances, thus paving the way for corroborated practical methodological application (p. 3).

Moore was concerned about "the progress of distance education being hindered by lack of attention to what he called the 'macro factors'" (Keegan, 1986, p. 69). He indicated that in this area of education there was a need to describe and define the field, to discriminate between the various components of the field, and to identify the critical elements of the various forms of learning and teaching.

Keegan (1988b) reaffirmed the continued need for a theory of distance education when he said, "Lack of accepted theory has weakened distance education: there has been a lack of identity, a sense of belonging to the periphery and the lack of a touchstone against which decisions on methods, on media, on financing, on student support, when they have to be made, can be made with confidence" (p. 63); and more recently, "A

firmly based theory of distance education will be one which can provide the touchstone against which decisions--political, financial, educational, social--when they have to be taken, can be taken with confidence". This would replace the ad hoc response to a set of conditions that arises in some 'crisis' situation of problem-solving, which normally characterizes this field of education (Keegan in Holmberg, 1989).

In a general sense, theory is taken to mean a set of hypotheses logically related to one another in explaining and predicting occurrences. Holmberg and Perraton stated that

> the aim of the theoretician is to find explanatory theories; that is to say, the theories which describe certain structural properties of the world, and which permit us to deduce, with the help of initial conditions, the effects to be explained....Theoretical, to bring explanation, on the other hand practical, to provide for application or technology (Holmberg, 1985, p. 5).

Keegan added,

> A theory is something that eventually can be reduced to a phrase, a sentence or a paragraph and which, while subsuming all the practical research, gives the foundation on which the structures of need, purpose and administration can be erected (in Holmberg, 1989, p. 145).

Holmberg recognized that it is perfectly possible to investigate a subject area without any formulated theory with a view to finding the answers to one or more questions. It is now much more common to insist that a theory is needed to guide a study and to help in making deductions. Holmberg (1986) indicated, "a basis for a theory of distance education will be constructed as a descriptive foundation ordering facts and ideas about distance education in a systematic way. A theory explaining and predicting occurrences in distance education is imaginable as far as teaching and learning are concerned" (p. 104).

Holmberg suggested that distance education has been characterized by a trial and error approach with little consideration being given to a theoretical basis for decision-making. He suggested that "the theoretical underpinnings of distance education are fragile. Most efforts in this field have been practical or mechanical and have concentrated on the logistics of the enterprise" (Keegan, 1988b, p. 63).

To some, distance education represents a deviation from conventional education. Holmberg claimed it was a distinct form of education. Keegan (1986, p. 270) concluded that distance education "...is a distinct field of education, parallel to and a complement of conventional education." Shale (1988) countered that "all of what constitutes the process of education when teacher and student are able to meet face-to-face also constitutes the process of education when the teacher and student are physically separated" (p. 26).

Cropley and Kahl (1983) compared and contrasted distance education and face-to-face education in terms of psychological dimensions and claimed neither set of principles emerged in a pure form. Peters strongly stated:

> Anyone professionally involved in education is compelled to presume the existence of two forms of instruction which are strictly separable: traditional face-to-face teaching based on interpersonal communication and industrialized teaching, which is based on objectivized, rationalized technologically-produced interaction (in Keegan, 1986, p. 80).

In his landmark work, *The Foundations of Distance Education*, Keegan classified theories of distance education into three groups:

- theories of independence and autonomy
- theory of industrialization of teaching
- theories of interaction and communication

A fourth category seeks an explanation of distance education in a synthesis of existing

theories of communication and diffusion, as well as philosophies of education.

Theories of Independence and Autonomy

Independent Study--Charles Wedemeyer

For Wedemeyer, the essence of distance education was the independence of the student. This was reflected in his preference for the term "independent study" for distance education at the college or university level. Wedemeyer was critical of contemporary patterns of higher education, believed that outdated concepts of learning and teaching were being employed, and that they failed to utilize modern technologies in ways that could alter the institution. (Keegan, 1986)

Wedemeyer set forth a system, its ten characteristics emphasizing learner independence, and adoption of technology as a way to implement that independence:

- The system should be capable of operation any place where there are students--or even only one student--whether or not there are teachers at the same place at the same time.
- The system should place greater responsibility for learning on the student.
- The system should free faculty members from custodial-type duties so that more time can be given to truly educational tasks.
- The system should offer students and adults wider choices (more opportunities) in courses, formats, methodologies.
- The system should use, as appropriate, all the teaching media and methods that have been proved effective.
- The system should mix and combine media and methods so that each subject or unit within a subject is taught in the best way known.
- The system should cause the redesign and development of courses to fit into an "articulated media program."
- The system should preserve and enhance opportunities for adaptation to individual differences.
- The system should evaluate student achievement simply, not by raising barriers concerned with the place, rate, method, or sequence of student study.
- The system should permit students to start, stop and learn at their own pace (In Keegan, 1986, p. 63).

Wedemeyer proposed the separation of teaching from learning as a way of breaking education's "space-time barriers." He suggested six characteristics of independent study systems:

- The student and teacher are separated.
- The normal processes of teaching and learning are carried out in writing or through some other medium.
- Teaching is individualized.
- Learning takes place through the student's activity.
- Learning is made convenient for the student in his own environment.
- The learner takes responsibility for the pace of his or her own progress, with freedom to start and stop at any time (in Keegan, 1986, p. 64).

Wedemeyer noted four elements of every teaching-learning situation: a teacher, a learner or learners, a communications system or mode, and something to be taught or learned. He proposed a reorganization of these elements that would accommodate physical space and to allow greater learner freedom. Key to the success of distance education, Wedemeyer believed, was the development of the relationship between student and tutor.

Independent Study--Michael Moore

Formulated in the early 1970s, Moore's theory of distance education, which he calls "independent study", is a classification method for distance education programs. Shaped in part by Moore's adult education and university extension experience, it examines two variables in educational programs: the amount of learner autonomy and the distance between teacher and learner.

For Moore, distance is composed of two elements, each of which can be measured. First is the provision for two-way communication (dialog). Some systems or programs offer greater amounts of two-way communication than others. Second is the extent to which a program is responsive to the needs of the individual learner (structure). Some programs are very structured, while others are very responsive to the needs and goals of the individual student.

In the second part of his theory, Moore addresses learner autonomy. He notes that in traditional school settings learners are very dependent on teachers for guidance, and that in most programs, conventional and distance, the teacher is active, while the student is passive.

In distance education, there is a gap between teacher and student, so the student must "accept a high degree of responsibility for the conduct of the learning program" (Keegan, 1986, p. 74). The autonomous learner needs little help from the teacher, who may be more of a respondent than a director. Some adult learners, however, require "help in formulating their learning objectives and in identifying sources of information and in measuring objectives" (Keegan, 1986, p. 74).

Moore classifies distance education programs as "autonomous" (learner-determined) or "non-autonomous" (teacher-determined), and gauges the degree of autonomy accorded the learner by answering the following three questions:

- Autonomy in setting of objectives? Is the selection of learning objectives in the program the responsibility of the learner or of the teacher?
- Autonomy in methods of study? Is the selection and use of resource persons, of bodies and other media, the decision of the teacher or the learner?
- Autonomy in evaluation? Are the decisions about the method of evaluation and criteria to be used made by the learner or the teacher? (Keegan, 1986, p. 75).

Theory of Industrialization of Teaching--Otto Peters

In a major treatise on education, Otto Peters of Germany developed a view of distance education as an industrialized form of teaching and learning. He examined a research base formed in his work that included an extensive analysis of the distance teaching organizations of the 1960s. This led him to propose that distance education could be analyzed by comparison with the industrial production of goods. He stated that "...from many points of view conventional, oral, group-based education is a pre-industrial form of education." (in Keegan, 1986, p. 81). His statement implied that distance teaching could not have existed before the industrial era. Based on economic and industrial theory, Peters (1988), proposed the following new categories (terminology) for the analysis of distance education.

A. rationalization: the use of methodical measures to reduce the required amount of input of power, time and money. In distance education, "ways of thinking, attitudes and procedures can be found which only established themselves in the wake of an increased rationalization in the industrialization of production processes." (p. 98)

B. division of labor: division of a task into simpler components or subtasks. In distance education, the conveying of information, counseling, assessment and recording of performance, are performed by separate individuals. To Peters, "the division of labor is the main prerequisite

for the advantages of [distance education] to become effective." (p. 100)

C. mechanization: the use of machines in a work process. Distance education, Peters notes, would be impossible without machines. "Duplicating machines and transport systems are prerequisites, and later forms of distance teaching have the additional facilities of modern means of communication and electronic data processing installations." (p. 101)

D. assembly line: commonly, a method of work in which workers remain stationary, while objects they are working on move past them. In traditional distance education programs, materials for both teacher and student are not the product of an individual. Rather, instructional materials are designed, printed, stored, distributed and graded by specialists.

E. mass production: the production of goods in large quantities. Peters noted that, because demand outstrips supply at colleges and universities, there has been a trend toward large-scale operations not entirely consistent with traditional forms of academic teaching. Mass production of distance education courses, however, can enhance quality, Peters believed that "the large number of courses produced forces distance teaching organizations to analyze the requirements of potential distance learners far more carefully than in conventional teaching and to improve the quality of the courses." (p. 103)

F. preparatory work: determining "how workers, machines and materials can usefully relate to each other during each phase of the production process." Peters believed that the success of distance education "depends decisively on a 'preparatory phase'. It concerns the development of the distance study course involving experts in the various specialist fields with qualifications also often higher than those of other teachers involved in distance study." (p. 104)

G. planning: the "system of decisions which determines an operation prior to it being carried out." Peters notes that planning is important in the development phase of distance education, "as the contents of correspondence units, from the first to the last, must be determined in detail, adjusted in relation to each other and represented in a predetermined number of correspondence units." The importance of planning is even greater when residential study is a component of a distance education program: "these supplementary teaching events are not intended to repeat academic contents already offered, nor have an 'enrichment' function, but should be structurally integrated in the distance study course." (p. 104)

H. organization: "creating general or permanent arrangements for purpose-oriented activity." Peters notes the relationship between rational organization and effectiveness of the teaching method. "Organization...makes it possible for students to receive exactly predetermined documents at appointed times, for an appropriate university teacher to be immediately available for each assignment sent in, [and] for consultations to take place at fixed locations at fixed times...." Organization, Peters points out, is optimized in large distance education programs. (p. 105)

I. scientific control methods: by which "work processes are analyzed systematically, particularly by time studies, and in accordance with the results obtained from measurements and empirical data the work processes are tested and controlled in their elementary details in a planned way, in order to increase productivity, all the time making the best possible use of working time and the staff available." In distance education, some institutions hire experts to apply techniques of scientific analysis to the evaluation of courses. (p. 106)

J. formalization: the predetermination of the phases of the manufacturing process. In distance education, "all the points in the

cycle, from student to distance teaching establishment to the academics allocated, must be determined exactly." (p. 106)

K. standardization: the limitations of manufacture to a restricted "number of types of one product, in order to make these more suitable for their purpose, cheaper to produce and easier to replace." In distance education, "not only is the format of the correspondence units standardized, [so is] the stationery for written communication between student and lecturer, and the organizational support, as well as each single phase of the teaching process, but also the academic contents." (p. 107)

L. change of function: the change of the role or job of the worker in the production process. In distance education, change of function is evident in the role of the lecturer. "The original role of provider of knowledge in the form of the lecturer is split into that of study unit author and that of marker; the role of counselor is allocated to a particular person or position. Frequently, the original role of lecturer is reduced to that of a consultant whose involvement in distance teaching manifests itself in periodically recurrent contributions." (p. 108)

M. objectification: the loss, in the production process, of the "subjective element which used to determine craft[s]men's work to a considerable degree." (p. 108) In distance education, "most teaching functions are objectified as they are determined by the distance study course as well as technical means. Only in written communication with the distance learner or possibly in a consultation or the brief additional face-to-face events on campus has the teacher some individual scope left for subjectively determined variants in ...teaching method." (p. 109)

N. concentration and centralization: because of the large amounts of capital required for mass production and the division of labor, there has been a trend to "large industrial concerns with a concentration of capital, a frequently centralized administration, and a market that is not seldom monopolized." (p. 109) Peters noted the trend toward distance education institutions serving very large numbers of students. The Open University of the United Kingdom, for instance, had more than 70,000 students in 1988. It is more economical to establish a small number of such institutions serving a nation population, rather than a larger number of institutions serving regional populations.

Peters (p. 100) concluded that for distance teaching to become effective, " the principle of the division of labor is thus a constituent element of distance teaching." The teaching process in his theory of industrialization is gradually restructured through increasing mechanization and automation. He stated that:

- The development of distance study courses is just as important as the preparatory work taking place prior to the production process.
- The effectiveness of the teaching process is particularly dependent on planning and organization.
- Courses must be formalized and expectations from students standardized.
- The teaching process is largely objectified.
- The function of academics teaching at a distance has changed considerably vis-a-vis university teachers in conventional teaching.
- Distance study can only be economical with a concentration of the available resources and a centralized administration (p. 110).

According to Peters, "within the complex overall distance teaching activity one area has been exposed to investigation that had been regularly omitted from traditional didactic analysis" (p. 111). New concepts were used to describe new facts that merit attention. He did not deny there were disadvantages to a theory of the industrialization of teaching but

in any exploration of teaching, a recognition of the industrial structures characteristic of distance teaching need to be taken into account in decision-making.

Theory of Interaction and Communication

Guided Didactic Conversation--Börje Holmberg

Holmberg's theory of distance education, what he calls "guided didactic conversation," falls into the general category of communication theory. Holmberg notes that his theory "seems to have explanatory value in relating teaching effectiveness to the impact of feelings of belonging and cooperation as well as to the actual exchange of questions, answers and arguments in mediated communication" (1986, p. 123).

Holmberg offers seven "background assumptions" for his theory (p. 123):

- that the core of teaching is interaction between the teaching and learning parties; it is assumed that simulated interaction through subject-matter presentation in pre-produced courses can take over part of the interaction by causing students to consider different views, approaches and solutions and generally interact with a course
- that emotional involvement in the study and feelings of personal relation between the teaching and learning parties are likely to contribute to learning pleasure
- that learning pleasure supports student motivation
- that participation in decision-making concerning the study is favorable to student motivation
- that strong student motivation facilitates learning
- that a friendly, personal tone and easy access to the subject matter contribute to learning pleasure, support student motivation and thus facilitate learning from the presentations of pre-produced courses, i.e., from teaching in the form of one-way traffic simulating interaction, as well as from didactic communication in the form of two-way traffic between the teaching and learning parties
- that the effectiveness of teaching is demonstrated by students' learning of what has been taught.

These assumptions, Holmberg believes, are the basis of the "essential teaching principles of distance education." From these assumptions he formed his normative teaching theory: "Distance teaching will support student motivation, promote learning pleasure and make the study relevant to the individual learner and his/her needs, creating feelings of rapport between the learner and the distance-education institution (its tutors, counselors, etc.), facilitating access to course content, engaging the learner in activities, discussions and decisions and generally catering for helpful real and simulated communication to and from the learner" (p. 123).

Holmberg himself notes that this is "admittedly a leaky theory" (1986, p. 125). However, he adds, "...it is not devoid of explanatory power: it does, in fact, indicate essential characteristics of effective distance education." Further, it is apparently logically consistent and it does "establish functional relationships between teaching and expected outcome of learning " (p. 125).

A Synthesis of Existing Theories--Hilary Perraton

Perraton's theory of distance education is composed of elements from existing theories of communication and diffusion, as well as philosophies of education. It is expressed in the form of 14 statements, or hypotheses. The first five of these statements concern the way distance teaching can be used to maximize education:

- You can use any medium to teach anything.

- Distance teaching can break the integuments of fixed staffing ratios which limited the expansion of education when teacher and student had to be in the same place at the same time.

- There are circumstances under which distance teaching can be cheaper than orthodox education, whether measured in terms of audience reached or of learning.

- The economies achievable by distance education are functions of the level of education, size of audience, choice of media and sophistication of production.

- Distance teaching can reach audiences who would not be reached by ordinary means.

The following four statements address the need to increase dialogue:

- It is possible to organize distance teaching in such a way that there is dialogue.

- Where a tutor meets distance students face-to-face, the tutor's role is changed from being a communicator of information to that of a facilitator of learning.

- Group discussion is an effective method of learning when distance teaching is used to bring relevant information to the group.

- In most communities there are resources which can be used to support distance learning to its educational and economic advantage.

The final five statements deal with method:

- A multi-media program is likely to be more effective than one which relies on a single medium.

- A systems approach is helpful in planning distance education.

- Feedback is a necessary part of a distance-learning system.

- To be effective, distance-teaching materials should ensure that students undertake frequent and regular activities over and above reading, watching or listening.

- In choosing between media, the key decision on which the rest depend concerns the use of face-to-face learning. (Perraton, 1988, p. 37)

A Theoretical Framework for Distance Education--Desmond Keegan

Keegan (1986) suggested that the theoretician had to answer three questions before developing a theory of distance education:

First, *is distance education an educational activity*? Keegan's answer was that, while distance education institutions possess some of the characteristics of businesses, rather than of traditional schools, their educational activities are dominant. Distance education is a more industrialized form of education. The theoretical bases for distance education, Keegan pointed out, were within general education theory.

Second, *is distance education a form of conventional education*? Keegan believed that, because distance education is not based on interpersonal communication and is characterized by a privatization of institutionalized learning (as is conventional education), it is a distinct form of education. Therefore, while the theoretical basis for distance education could be found within general education theory, it could not be found "within the theoretical structures of oral, group-based education" (p. 116).

Third, *is distance education possible? Is it a contradiction in terms*? Keegan points out that if education requires intersubjectivity--"a shared experience in which teacher and learner are united by a common zeal"--then distance education is a contradiction in terms. Distance instruction is possible, but distance education is not (p. 118).

Central to Keegan's concept of distance education is the separation of the teaching

acts in time and place from the learning acts. Successful distance education, he believes, requires the reintegration of the two acts: "The intersubjectivity of teacher and learner, in which learning from teaching occurs has to be artificially recreated. Over space and time, a distance system seeks to reconstruct the moment in which the teaching-learning interaction occurs. The linking of learning materials to learning is central to this process" (p. 120).

Reintegration of the act of teaching at a distance is attempted in two ways. First, "Learning materials, both print and non-print, are designed to achieve as many of the characteristics of interpersonal communication as possible" (p. 122). Second, when courses are presented, reintegration of the teaching act is attempted by a variety of techniques, including: "communication by correspondence, telephone tutorial, on-line computer communication, comments on assignments by tutors or computers, teleconferences, etc." (p.122).

The process of reintegrating the act of teaching in distance education, Keegan suggests, results in at least five changes to the normal structure of oral, group-based education (p. 125):

- the industrialization of teaching
- the privatization of institutional learning
- change of administrative structure
- different plant and buildings
- change of costing structures

Keegan offers three hypotheses drawn from his theoretical framework (p. 126):

- distance students have a tendency to drop out in those institutions in which structures for the reintegration of the teaching acts are not satisfactorily achieved
- distance students have difficulty in achieving quality of learning in those institutions in which structures for the reintegration of the teaching acts are not satisfactorily achieved
- the status of learning at a distance may be questioned in those institutions in which the reintegration of the teaching acts are not satisfactorily achieved

Summary

Distance education has numerous meanings because the term has been applied to a wide variety of programs serving numerous audiences via a wide variety of media. For instance, in England, distance education is exemplified by the Open University of the United Kingdom, serving a non-traditional, adult population via electronic telecommunications, while in Zimbabwe, the University of Zimbabwe supplements teacher education with print-based correspondence courses. So, a definition of distance education may be valid in one place and time, but not in another. Arguably the best-known definition of distance education has been offered by Keegan, who has combined the essential elements from many definitions of distance education.

The history of distance education is relatively brief, only about one hundred years. Two characteristics have marked its development. First, there has been the adoption of increasingly sophisticated communications technologies as such technologies have become available. Second, distance education has developed in each locale in accordance with local resources and the philosophy of the organizations providing instruction.

The development and study of distance education have been hampered by the lack of a generally accepted theory of distance education. The problem has not been a lack of proposed theories. Numerous theories have been proposed, falling into two categories: theories that attempt to explain distance education by drawing on existing theories of education and communication (such as Perraton's), and theories created "from scratch" (such as Peters'). These

theories have been shaped by the experiences of the researchers, who have approached distance education from their own angle; a particular paradigm of distance education. Wedemeyer's concern with the independence of the student reflected his experiences with adult students served by university extension programs. Peters' preoccupation with the industrialization of distance education reflected distance education as it has been practiced in his native Germany.

It is for this reason that it is so difficult to name a single "best" theory of distance education. Just as definitions vary by time and locale, so does the explanatory power of a theory. A theory that has adequate explanatory power at one time and in one place may be inadequate at another time and in another place. Distance education as practiced at the FernUniversität in Germany is as unlike distance education as practiced in Iowa via the Iowa Communications network as it is unlike the University of Zimbabwe's correspondence study program. It may be asking too much for one theory to adequately address distance education in all its manifestations.

Perraton's synthesis of existing theories of distance education is, arguably, the most powerful theory so far advanced for distance education as it is practiced today in most parts of the world. It is less adequate as a theory of distance education as practiced in the United States. However, it is worth asking if distance education, as practiced in the United States, requires its own distinctive theory. There is evidence that the answer to this question is "no".

At the root of distance education theory is the belief that distance education is fundamentally different from traditional, face-to-face instruction. Keegan made what was, in 1986, a convincing case for this view. However, especially in the United States, technological advances and new philosophies of distance education have resulted in a new paradigm of distance education, its goal to offer to the distance student an experience as much like that of traditional, face-to-face instruction as possible. A refinement of this approach, what might be called the "Iowa Model," featuring intact classrooms and live, two-way interaction, comes closest to realizing the goals of the American concept of distance education. Further advances are inevitable, resulting in greater "transparency" of distance education technology and offering greater similarity with traditional classroom instruction. It is known that good distance education pedagogy is good pedagogy in any classroom. In the future, if indeed not now, it may be that good education theory and good distance education theory will be one and the same.

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Distance Education - Review of the Research

In his 1987 article, "The Development of Distance Education Research," Börje Holmberg, a leading distance education theorist and researcher, suggested that research into distance education be divided into eight categories:

- philosophy and theory of distance education
- distance students, their milieu, conditions and study motivations
- subject-matter presentation
- communication and interaction between students and their supporting organization (tutors, counselors, administrators, other students)
- administration and organization
- economics
- systems (comparative distance education, typologies, evaluation, etc.)
- history of distance education (Holmberg, 1987, p. 20)

Each of these areas of research is, indeed, represented in the literature. However, each area is not equally represented. A number of factors related to the nature of distance education make this so. Because the field (and, by extension, its practitioners) is so practical, research in distance education has been dominated by attempts to answer questions of immediate, practical significance. Further, a tendency of the field to be supportive of a liberal view of education and free access to the benefits of education has led its researchers to emphasize questions dealing with the student. Therefore, two of Holmberg's categories of distance education research, *distance students, their milieu, conditions and study motivations*, as well as *systems* (media comparison studies), dominate the literature. On the other hand, because of the relative youth of the field, Holmberg's final category, *history of distance education*, is the subject of few studies.

The practical nature of distance education not only influences the *subject* of research, it also influences the *type* of research conducted. A large percentage of the literature about distance education is of the first-person, "how-I-did-it" variety, such as accounts of how distance education was adopted in one school or community. Such accounts can be very interesting, and perhaps informative, but they are anecdotal in nature and lack the rigor required to be properly termed "research."

Further, much of the research in distance education is of the case-study variety, examining a single program or school. As such, this research lacks generalizability to the field of distance education, and when a single course is the object of study, the data may not even be generalizable to the entire distance education program of a given institution. Worse, there is some question as to the validity of some studies. Much of the research is small-scale and exploratory in nature. Studies reporting data drawn from fewer than 20 questionnaires have been published, as well as from experiments comparing student achievement and attitudes based on 13-minute treatments (lessons).

One reason for the ubiquity of such articles is the very nature of distance education as it is being practiced today. Particularly in the United States, distance education is undergoing a period of rapid change, of redefinition; what Rogers (1983) calls "re-invention." While distance education is some one hundred years old, the field is being reborn, the result of newer technologies that have substantially changed the nature of distance education. The explosion of interest in the field, manifested by greater numbers of outlets for scholarly research (professional research journals, conferences, and so on), as well as articles in the more mainstream education journals and the popular press, has been fueled by the availability and application of these technologies.

This chapter will discuss three of Holmberg's categories of research: *distance*

students, their milieu, conditions and study motivations; will be addressed first, followed by *systems of distance education*. Elements of Holmberg's third category, *communication and interaction between students and their supporting organization*, will be blended into the above two categories, where appropriate. It should be noted that other categories are dealt with in other chapters of this monograph. The *philosophy and theory of distance education*, as well as its *history*, are discussed in chapter one. *Administration and organization*, and, *economics*, are outlined with other operational issues in chapter six.

Distance Students--Their Milieu, Conditions, and Study Motivation

Within this broad category of research dealing with the role of students, many studies have attempted to discover reasons for student success or failure in distance education courses. Special emphasis has been placed on explaining the high incidence of dropout that has historically plagued this form of education. Among the variables examined have been: locus of control, academic and social integration variables, motivation, and learning styles.

Before one can suggest a cure for a problem, it is necessary to first determine if there is, indeed, a problem. Then, exploratory research can be used to learn the dimensions and gain an understanding of the problem.

In a 1980 study, Coldeway (1991) asked adult distance education students about their course-related behavior, their activity and interaction with staff, their study habits, and motivation. He found that:

- Students managed their time in a variety of ways that had more to do with their own lifestyles and schedules than the way the courses were structured.
- Most students progressed through courses more slowly than the institution suggested.
- Most students did not study consistently, and their study was frequently disrupted by events unrelated to the course.
- Motivation was not a stable characteristic: it was higher when the student approached an assessment point or "had an important interaction with a member of the instructional staff of the institution (usually a telephone tutor)" (p. 8).
- Students conferred with tutors far less frequently than school policy prescribed.
- Attrition rates were somewhat inflated by the number of students who enrolled in courses, did very little work but did not officially withdraw. These students (referred to as non-starts) later withdrew or were withdrawn, but "it appeared that the course, per se, had little impact on their resulting non-start withdrawal" (p. 8).

Coldeway concluded that "learner motivation was a somewhat fragile thing," (p. 8) and that "hypothesized strong motivational factors for students (e.g. need to learn, need for credit and credentials, something to fill time, etc.) are overshadowed by competing factors in the personal lives of students" (p. 9).

A replication of the study, reported by Coldeway in 1991, indicated very little change in student behavior. First, study time per week was up only slightly, from 5.2 hours to 5.9 hours. Second, the average self-reported motivation level was also up slightly, from 3.7 to 4.23 (on a 7-point scale). Finally, student contact with course coordinators and tutors via telephone was approximately the same as in the earlier study (p. 9).

Coggins, (1988) in a study of students associated with the University of Wisconsin System External Degree Program, examined the relationship between "personal variables" (learning style and demographic data) and program completion rate. She found that completers and noncompleters did not differ significantly on variables related to gender, occupation, marital status, presence or absence of children, distance from campus, or age of entry into the baccalaureate

program. However, there was a significant difference between the two groups on a number of variables. Completers had entered the program with higher levels of education and they had greater expectations of earning higher grades, as well as a degree.. Interestingly, the two groups of students differed in preferred course content: noncompleters tended to prefer inanimate objects-related content over people content .

Laube (1992) compared characteristics of completer/persisters and dropout/nonstarters in a Canadian secondary distance education program. He found that:

- The completer/persister group tended to have post-secondary education goals, while the dropout/nonstart group tended to have secondary education goals.
- Completer/persisters tended to study more than dropout/nonstarters.
- The two groups did not differ significantly in the amount of assistance they received at home in completing their assignments.
- The two groups did not differ significantly in the amount of contact they initiated with the school.
- Completer/persisters were overwhelmingly positive in their attitude toward their graders and tutors. Dropout/nonstarters also tended to hold positive views, but a substantial number were undecided.
- The two groups did not differ significantly in the degree to which they missed socializing with their peers.

Dille and Mezack (1991) identified predictors of high-risk among college distance education students. They found that:

- Successful students were more internally oriented than non-successful students, and, as such, "would be expected to persevere more than their more external classmates because 'internals' perceive events as contingent upon their own behavior" (p. 29).
- Learning style (as measured by David A. Kolb's Learning Style Inventory), "was not a significant variable in predicting success or non-success in a telecourse" (p. 31).
- Grade point average of successful students was higher than that of non-successful students.
- Successful students were older than non-successful students.
- Marital status was related to academic success. Married students were most successful, while divorced students were least successful.
- Ethnic background, sex, and number of children or children living at home were not statistically significant in their effect on student performance. Neither were "number of college credit hours for current term, reason for taking the telecourse rather than an on-campus class, previous experience with telecourses, student perception of own learning style, reason for taking the telecourse, and importance of completing the telecourse" (p. 33).

When college students withdraw from distance education courses, one frequently offered reason is a lack of time. Garland (1993) applied the qualitative methodology of ethnography in a study designed to gain a better understanding of the motivations for student withdrawal. Ethnography, as Garland defines it, "penetrates facades to represent and elucidate cultural knowledge, what can and cannot be said, as influenced by subjectivity and power relationships" (p. 9). It does so by "making inferences from what people say and what is assumed to what they know, to their psychological reality" (p. 6).

What Garland's study revealed was that students' claim of lack of time was "a socially acceptable explanation," and "a simplified explanation of the difficulties they were experiencing" (p. 8). While time constraints were indeed a factor in dropout, the true reasons for the students' withdrawal, Garland found, were more complex, including: lack of prerequisite knowledge of

the course content, lack of support from peers and family, stress, poor grades, procrastination, need for face-to-face interaction, pride, poor tutor feedback, weak goal commitment, and fear of failure (p. 8). Many of the problems cited by dropouts were shared by persisters as well, leading Garland to note that "there is a complicated mix of situational, institutional, dispositional and epistemological problems which pose barriers to persistence and which combine and interact to result, for some students, in a dropout decision that is essentially idiosyncratic in nature" (p. 10). These categories are defined in the following way:

> Situational problems include those associated with the student's milieu, such as poor family support, multiple roles and a lack of free time. Institutional barriers comprise cost, bureaucracy, and problems with tutorial support and instructional design. Dispositional problems reflect the student's psychological and sociological makeup. They include unclear goals, procrastination, learning style problems, pride and lack of self-confidence (p. 10).

In addition, there may be epistemological problems, such as "'course 'difficulty', problems with subject matter, academic incompatibility, or course structure/need for specialized competence" (p. 10).

One approach to explaining adult student dropout from distance education has been the development, by David Kember, of a "Longitudinal-Process Model" (1989). His model is based on models used in other fields of education not directly applicable to the field of distance education. Models differ from theories. To explain a construct such as dropout (attrition), Kember noted, a theory

> ...would contain so many constructs that it would become unwieldy if not unmanageable. Such situations call for the use of theoretical models, which are simplified versions of reality that strip away the minute details to concentrate on factors that are assumed or deduced to be important (p. 279).

There are five components of Kember's model:

1. Characteristics

Individual, family, and work backgrounds have weak direct correlations with dropout. However, they influence other components of the model. *Educational background* (formal school qualifications or examination results). Has "an influence on later components of the model rather than predictors of success or barriers for entry to the course" (p. 291). Students with limited schooling may be expected to have difficulty with academic integration, and their study approach may not be suited for college-level work.

2. Goal commitment

Extrinsic motivation is the level of commitment to completion of a course or program.

Intrinsic motivation is "the level of interest in the subject matter itself or interest in learning for its own sake" (p. 292). Research has suggested that, of the two, "intrinsic motivation produces a stronger goal commitment," (p. 292) and is therefore "more likely to contribute to successful completion of a course" (p. 293).

3. Academic aspects

For Kember, "the academic environment is taken to include all facets of the offering of the distance education course of study by the institution" (p. 293). This includes course materials, tutorial assistance, and any other form of interaction between student and institution. With regard to course materials, the student requires "normative congruence." That is, course content and curriculum should be compatible with "students' perceived career needs and interests" (p. 293). Interaction and tutorial assistance lead to "collective affiliation" and help to determine if students have positive feelings toward the institution.

4. Social and work aspects

Students must be able to "integrate the demands of part-time off-campus study with

family, work, and social commitments" (p. 294).

5. Cost/benefit analysis

Kember noted that the distance education student "has to decide whether the opportunity costs of time spent studying are worthwhile in view of the perceived benefits of the eventual qualification or other benefits the student might derive from studying" (p. 295). Further, because variables in the model change with time, the student has to continually reassess the costs and benefits of continued study.

Naturally, many distance education college students do not drop out. However, they may face a variety of challenges that may impede their progress in courses. While many of these challenges are not unique to distance education programs or the students enrolled in them, the nature of distance education may be a substantially aggravating factor.

Academic procrastination is not unique to distance education; perhaps 95 percent of college students engage in it (Wilkinson and Sherman, 1990). However, because the distance education student exercises considerable control over his or her own learning, procrastination is of special concern to the distance educator. As Wilkinson and Sherman (1990) noted: "If ever there was an opportunity to procrastinate on academic tasks, distance education offers that opportunity" (p. 47). However, in spite of the widespread nature of procrastination in distance education, little research has been conducted on the subject.

The goal of Wilkinson and Sherman's study was to determine the extent of the problem of academic procrastination by interviewing distance educators. Among the findings of the study were:

- More than one-third (37.5 percent) of distance educators thought academic procrastination by students was frequently or always a problem.
- Sixty-one percent "indicated that 10 percent or less of their distance learners did not complete any assignments. Slightly more than half (51.5 percent) of distance educators "indicated that 10 percent or less withdrew or were dropped for not completing assignments" (p. 50).
- More than two-thirds said they thought academic procrastination was frequently caused by "cognitive blocks," (inadequate information, unclear priorities, and failure to appreciate the need for timely action, and so on) and environmental conditions (clutter, disorganization, noise, unmanageable workloads, distractions from friends and relatives, and so on).

Wilkinson and Sherman found that distance educators' views on academic procrastination were "based more on impressions and hearsay than systematic observation and analysis" (p. 52). Therefore, "they may also have a distorted idea of the prevalence and importance of academic procrastination" (p. 52).

Although most distance educators studied did not believe that academic procrastination was a major problem, they applied a variety of strategies to reduce it. Wilkinson and Sherman noted that the strategies employed seemed to have "little relationship to their perceptions of student non-completion and academic procrastination or data they had collected...." (p. 52). The researchers surmise that distance educators may "implement these strategies based on an intuitive belief that students will procrastinate unless something is done by programs or faculty" (p. 52).

In a related study, Stone (1992) examined the role of student-tutor contact in timely completion of a college distance education course. Stone found that regular telephone contact between student and tutor did not result in significant improvement in course completion rates. However, he did find that students who were identified as having external locus of control completed their coursework significantly faster when they had regular tutor contact.

Bernt and Bugbee (1993) examined study practices as an explanation of academic success of adults in distance education. The authors cited previous research that indicated that adult learners tend to prefer self-directed modes of learning, have lower expectations of academic success, and are more problem-oriented than curriculum-oriented. The differences are even greater for adult students in distance education programs. They tend to be less schooled, or less-recently schooled, and they may require more "pedagogical contact and more evaluative feedback", but receive less. They have more material to read than students in traditional courses, but they have less time to study it. Finally, because of such stresses and the very independence of independent study, dropout from college distance education courses tends to be high.

Bernt and Bugbee examined two types of study strategy dimensions with distance education students. First, primary strategies, "which are used to identify, understand, remember, and apply important subject matter" (p. 97). Second, secondary or support strategies, "which involve the formation and maintenance of attitudes related to learning and academic performance" (p. 98). The researchers concluded from their study that there was evidence that both primary and secondary strategies aided academic performance. Passers differed significantly from failers in their testwiseness, concentration, and time management skills, but did not differ so greatly in active learning, diligence, and positive attitude.

The researchers also found that students with different education levels differed in their study strategies--in time management, concentration, and testing strategies. This, they concluded, suggests "that distance learning students who have not completed college are 'at-risk' primarily because they lack metacognitive or executive skills for approaching coursework and examination-taking" (p. 108). Such students, the authors believed, may need more structure and direction than more experienced learners.

The relationship between gender and success in distance education courses was the subject of a study by Ross and Powell (1990). Data from the 1987-88 school year at Athabasca University, in Alberta, Canada, indicated that a greater percentage of women passed distance education courses. Further, "this higher completion trend was visible irrespective of the student's general study area, specific course selection, course level, mode of course delivery, student's program status, or the number of courses students had previously taken" (p. 10).

Among the reasons for the greater success of women in distance education courses, the authors speculated, were:

- More males were working outside the home while studying, which could affect academic performance.
- More female students were unmarried, and a greater proportion were single parents. While marital status has been tied to academic achievement, the women in the study "reported that they had someone other than a spouse/partner to rely on for support.
- Women initiated more telephone calls to their tutors, "thereby making better use of institutional support structures" (p. 11).
- More women regarded gaining a university credential from their courses as critical.
- More women regarded failing their first course at the university as serious.
- Many of the female students were working while taking courses and came from fields (such as health care) in which "career advances can be readily achieved through academic upgrading in a distance education environment" (p.11).

Student attitudes toward distance education courses as well as the relationship between attitudes and performance, have also been the subject of a number of studies. In general, these studies indicated that, while students learn equally well from lessons delivered with any medium, face-to-face or at a distance, they preferred the traditional classroom.

In their 1987 study of student perceptions of the effectiveness of graduate college courses taught via the TI-IN satellite system, Barker and Platten (1988) learned the following:

- Students enrolled in the course mainly to earn college credit toward a graduate degree.
- Students enrolled in the course lived an average of about 20 miles from the site where they received the downlink signal.
- A slim majority of students (53.8 percent), felt that the course maintained their interest as well as a traditionally-taught course. Slightly more students (56 percent) said they preferred regular classroom instruction, while more than two-thirds of the students said they would be interested in enrolling in other satellite-delivered courses.
- About half the students (46.2 percent) felt that the course was "somewhat harder" than traditional instruction, while the remaining students were evenly divided between those thinking difficulty was "the same" or "somewhat easier".
- There was limited interaction between students and instructor, with an average of only 6.5 calls from each site during the entire 13-session (three hours each) course. One factor that may have limited the number of calls was the inability of some sites to receive all the broadcasts due to technical problems related to the system.
- Virtually all of the students (96.8 percent) felt that the lesson objectives had been well presented by the instructor, while nearly a third of the students (30.7 percent) felt that the lessons seemed more organized than traditional classroom instruction. However, virtually the same number of students felt that it was easier to let their "mind wander" in the distance education class than in a traditional class.

The aspect of distance education the students most liked (unanimously) was the convenience of taking a graduate course close to home. The greatest weakness of the system, the students felt, was the limited interaction with the instructor and with students at the other sites.

Barker and Platten concluded that satellite-delivered instruction provided a useful service for geographically isolated students, and that it was preferable to older methods of distance instruction, such as traveling professors, non-interactive television, or correspondence study. However, satellite delivery of instruction, in their view, was not "a substitute for traditional classroom instruction if such instruction is available. This is not to criticize satellite courses. We believe that what still works best is a qualified, well-prepared teacher in the classroom" (p. 49).

St. Pierre and Olsen (1991) examined student attitudes toward correspondence study through The Pennsylvania State University. They found that:

- "Motivation was the single most important of the feedback-related independent variables influencing student satisfaction" (p. 67).
- There was a positive relationship between "student satisfaction and the opportunity to apply experiential learning and knowledge" (p. 68).
- "Prompt return of lessons in the beginning of the course was more significant for student satisfaction than prompt lesson return later in the course" (p. 68).
- "Didactic conversation with the instructor contributed significantly to the satisfaction of students comfortable with this type of exchange" (p. 68). Communication via the mail did not affect student satisfaction with the course.
- The relevance of course content and the helpfulness of the study guide and commentary were significant in predicting satisfaction with the course.
- Interaction between the student and the instructor, as well as the support staff,

was only minimally predictive of student satisfaction.

- Students satisfied with one correspondence course were more likely to take another.

The authors concluded that "all students, regardless of their sex or age, seem to be satisfied with correspondence study" (p. 69). Further, they reached a conclusion regarding this form of distance education somewhat at odds with the conclusion reached by Barker and Platten regarding satellite-delivered distance education. To St. Pierre and Olsen, "It should not be viewed only as an alternative to resident instruction for those students unable to take higher education courses through conventional means" (p. 68).

Wilkes and Burnham (1991) examined the link between motivation and satisfaction of adult learners in an electronic distance education environment (EDE). Their findings were at odds with some commonly-held beliefs of adult educators. The authors noted that "It has been presumed that programs and environments tailored to the needs, motives, and expectations of learners will result in higher participant satisfaction than those involving minimal consultation between learners and instructors" (p. 49). However, their study indicated that student satisfaction "is largely independent of the initial motives that impelled individuals to participate", suggesting that "the sources of variation in satisfaction lie elsewhere. There may be other internal variables which affect satisfaction, but external variables are probably more influential" (p. 49).

Wilkes and Burnham noted that "adult learner characteristics may not have much to do with satisfaction" (p. 49), and echoed (albeit somewhat more pithily) what other researchers have said in media comparison studies:

> Those factors which influence good instruction may be generally universal across different environments and populations. From observations and interviews it was concluded that the EDE system exaggerates an instructor's weaknesses. If instructors are boring in a face-to-face setting, they can reach undescribable depths of insipidity coming across the phone lines. A monotone voice is harder to concentrate on when coming from a distance than it is coming from within the same room. (p. 49)

Distance Education Systems

"The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievements any more than the truck that delivers our groceries causes changes in nutrition" (Clark, 1983, p. 445).

The "best current evidence" to which Clark referred a decade ago was hundreds of media comparison studies that indicated, unequivocally, that there is no inherent significant difference in the educational effectiveness of media. If researchers had not gotten the message before Clark's statement in 1983, they should have gotten it afterward. Further comparisons of the effectiveness of instructional media were not warranted. The specific medium used does not matter. The focus of future research should be the truly critical factor in determining student achievement: instruction itself (Whittington, 1987).

Unfortunately, much of the research being done in distance education is still of the media comparison type. Perhaps this is to be expected given the rapid development of distance education technology, especially in the area of two-way interactive television systems. With each technological advance there is the temptation to conduct media comparison research on the offhand chance that the use of the new technology might truly result in higher student achievement.

Martin and Rainey (1993) compared the achievement of high school students taught anatomy and physiology via satellite with the achievement of their peers who were taught the same material in a traditional classroom. The researchers found that, while there was no significant difference between the two groups in their attitudes towards the course

material, the achievement of the distance education students on the post-test was significantly higher than that of the traditionally-taught students. It should be noted that the two groups of students were taught by different teachers.

Egan, et al. (1992) compared student attitudes toward distance and traditional education as well as between two types of distance education. When conventional instruction was compared with live, interactive television, conventional instruction received significantly higher student ratings for organization of course and clarity of course content, relevance of course objectives to class sessions, integration of text and assignments, and value of visual materials and text screens.

When conventional instruction was compared with "Professor Plus," a series of videotapes of conventional instruction plus an on-site instructor/facilitator, the results were similar. In addition to the variables above, students rated conventional instruction superior in adequacy of presenter delivery and student interest. Distance learners regarded the two types of distance education systems as comparable. The authors suggested that this was because of the presence of an instructor/facilitator with the Professor Plus system.

Beare (1989) compared the effectiveness of three instructional formats: videotape, audiotape, and telelecture. Not surprisingly, given the history of media comparison research, "...individual instructional formats had little effect on student achievement..." (p. 64). Nor is it surprising that "...the lack of individual opportunity to interact on a daily basis with the instructor did not reduce student learning as measured by the course examinations" (p. 64).

What is surprising, perhaps, is that "distant learners found the course just as stimulating, were equally interested in the subject matter, and judged the instructor equally as skilled as did those receiving face-to-face instruction" (p. 65). However, personal circumstances of students can affect their attitudes toward the various instructional methods:

> The less formal questions asked of the video-only groups revealed that students respond favorably to video and audio instruction if it is the [only] way they can take the course or--even more important--keep their jobs. Distance education is not received as favorably by those who have a clear option for face-to-face instruction. (p. 66)

Souder (1993) compared the effectiveness of traditional vs. distance (satellite-delivered) instruction in three master's degree programs. Traditional classroom instruction was used to teach students at the Georgia Institute of Technology and the University of Alabama in Huntsville. Students enrolled in the National Technological University received the same instruction via satellite. Mean exam scores for all three groups were quite high, more than 90 on a 100-point scale. However, the NTU (distance) students scored significantly higher on the exam than the Georgia Tech students. The University of Alabama students' scores fell in the middle. The higher scores of the NTU students, the author suggests, may be explained by "age and experience advantages" peculiar to that group (p. 40).

Souder notes that the impact of distance education transcended achievement, that the nature of the particular medium and the form of student-student interaction characteristic of that form, afforded significant other benefits: "[The distance learners] gained a broadened network of valuable colleagues, skills in working with others and collaborating across distances, and many social skills beyond those offered by traditional classroom settings" (p. 50).

Cheng, Lehman and Armstrong (1991) compared performance of college students enrolled in traditional and computer conferencing classrooms. They found no significant differences between the treatment groups examined in the study. Further, at the end of the course, there were no significant differences among the groups in attitudes toward the subject matter.

Numerous studies have described or examined the efficacy of individual forms of

distance education, while others have examined aspects or components of those forms. Garrison (1990) used a description of audio teleconferencing to argue for an appropriate concentration on the role of the teacher and the importance of two-way communication in the education process. Along the way, he argued for the appropriate, conservative use of interactive communication technologies.

The core of Garrison's argument was that:

> ...education, whether it be at a distance or not, is dependent upon two-way communication. There is an increasing realization in the educational community that simply accessing information is not sufficient. In an educational experience information must be shared, critically analyzed, and applied in order to become knowledge. (p. 13)

A goal of some distance education programs is to make education more student-centered through the prepackaging of instructional materials that students may use when convenient. However, Garrison argued that this approach "ignores the essential nature of an educational learning experience" (p. 14). For Garrison, this "simply risks making learning more private and therefore less likely to transform the views and perspectives of the learner in a positive developmental manner" (p. 14).

Garrison argued that "the quality and integrity of the educational process is dependent upon sustained, two-way communication" (p. 15). Such communication, between student and teacher, and between student and student, is the prime benefit of teleconferencing. When this technology is applied to distance education, "the result is that distance education is no longer necessarily an independent and isolated form of learning but, instead, begins to approach the interactive ideal of an educational experience" (p. 15).

Garrison is a staunch supporter of audio teleconferencing, which he regards as "a distinct generation of distance education capable of providing unique and varied teaching/learning possibilities. Independent and isolated study is no longer the hallmark of distance education" (p. 17).

In a study conducted between 1986 and 1988, students in distance education classes offered by the University of Calgary were surveyed about their attitudes toward audio teleconferencing. Nearly all of the students (96 percent) agreed that they had been given adequate direction and support in the use of the equipment and procedures. Somewhat fewer (87 percent) felt that audio quality was at least acceptable. Additionally, the survey revealed that students were willing to take courses delivered by audio teleconferencing "regardless of technological inconveniences" (p. 20). Students seemed to be of two minds about the need to interact with faculty between sessions. Sixty-two percent of the students agreed that this was essential, however, only 40 percent had actually done so.

Garrison is critical of interactive television as a medium of distance education, charging that it is "really audio teleconferencing enhanced with a live television image of the instructor" (p.16). Bauer and Rezabek (1992) measured the effects of two-way visual contact on verbal interactivity during teleconferenced instruction. They compared verbal interaction under three conditions: first, two-way audio and video; second, two-way audio; and third, traditional instruction. The authors found that students in the audio-and-video group were less likely to interact verbally than students receiving two-way audio instruction only. Further, both groups were less likely to interact verbally than students in the traditional classroom.

Burge and Howard (1990) examined the attitudes of students at the University of Toronto toward audio teleconferencing as a form of distance education. Students generally felt successful in their courses: 87 percent said they "often" or "almost always" felt successful. The researchers asked a number of questions concerning the teleconferencing equipment. Approximately 57 percent of the students said practice with the equipment led them to feel more comfortable with it. However, many students felt uncomfortable with some of the

equipment and protocols required for interaction. The lack of visual cues in the classroom was a problem for many students. They suggested a variety of ways of fostering personal contact between and among students and the instructor.

Students made many comments about the class moderator and made numerous suggestions. Students asked that moderators develop a personal rapport with students. They stressed the importance of clear planning and organization by the moderator not only regarding the equipment, but also of course materials and procedures.

Russell (1989) described distance education using videocassettes in the Teacher Oriented Televised Education (TOTE) program at North Carolina State University. In this system, a traditionally-taught class is videotaped for use by distance students later. A second-semester Japanese language class was divided into two parts. One group attended the class "live," while it was being recorded. The other group watched the resulting videotapes. Of the students who viewed the tape only:

- Nearly three quarters (71 percent) "felt they did not learn the material as well as they would have in a traditional classroom setting" (however, their test scores were not significantly different from those of the traditionally-taught group).
- Fifty-seven percent believed that the inability to ask questions was the greatest disadvantage of this method of instruction.
- Eighty-eight percent of the students said they "definitely would take an entire language course via TOTE". The remaining students said they "might" (p. 3).

Among students taught in the classroom during the recording:

- All of the students "felt that they learned as well as if they were in a regular classroom not being recorded" (p. 3).
- Just over two-thirds of the students "would not mind having another language course this way." The remaining students said they would welcome the opportunity (p. 3).

Timmins (1989) examined the effectiveness of supplements to print-based distance education. Data from 367 higher education students in Australia indicated that the most valuable supplement to printed material was residential school (one week in length). Computer based instruction and telephone tutorial were judged to be less useful. However, an examination of the students' grades indicates that attendance at residential school "confers no apparent advantage at all" (p. 12) while taking advantage of telephone tutorials and computer based instruction, "is related to an advantage to the final grades of students of 8 to 9 percentage points" (p.13).

Ross, et al. (1991) described two programs for tutoring at-risk elementary school children at a distance; one using a local electronic bulletin board system, and a second using Applelink, a national network system featuring both electronic mail and teleconferencing. In the first program, student reactions were, on balance, negative. More than half of the students did not understand corrections made by their tutors, received little help with their writing skills, received insufficient time with their tutors, found the assignments difficult, and said they did not learn much from their tutors. Slightly more than half the students felt they had enough on-line time to complete messages, but about one third received a busy signal when they called. Most tutors (89 percent) felt that they needed more intensive training and 67 percent said they would have liked more personal contact with their students.

In the second program, student comments were more positive, with the most positive comments concerning tutors. Seventy percent or more of the students: liked their tutor, wanted to spend more time with their tutor, and felt that their tutor liked them. Sixty-nine percent of the students said they liked their assignments, and 65 percent said they learned from their tutors. Eighty percent of the tutors felt that they did not receive

adequate communication from classroom teachers, 50 percent said they were able to communicate their expectations to their students, and 60 percent were undecided on whether they enjoyed tutoring.

Johnson (1988) examined the attitudes of students from small, rural Iowa high schools toward interactive satellite instruction. Survey results indicated that the students had the following attitudes:

- The students held positive attitudes toward the strengths of satellite-delivered instruction, especially with regard to personal qualities of the teacher.
- Although students talked with their instructor only once a week, they were positive in their rating of student-teacher interaction.
- Students were only slightly positive in their attitude toward the benefits of satellite-delivered instruction beyond course content. They did not judge opportunities to establish relationships with other students and the development of independent learning to be among the major benefits of TI-IN.
- Students believed that TI-IN courses were easier than regular classes. This finding is contrary to previous research in the field.
- Although students were generally supportive of satellite-delivery of courses, they preferred traditionally-taught courses.

Jurasek (1993) surveyed the attitudes and perceptions of graduate students toward compressed video distance education technology. She found that students had a generally positive attitude toward both compressed video technology as a method of instruction delivery, as well as opportunities for interaction provided by the system. In both cases, students at the distant classroom had a significantly more positive attitude than students at the origination site. There was no significant difference in the average grades earned by the students at the two sites.

Summary

While it is always perilous to summarize research in a few sentences, it is also the obligation of those who have studied the literature extensively to provide others with their best estimates of what is reported. The distance education literature has several characteristics that make summarizations difficult, including:

- Distance education literature is largely anecdotal. Authors tend to publish reports of the results of a specific distance education project which makes generalization to other projects difficult.
- Distance education literature is dominated by comparison studies in which students learning at a distance are compared to students learning in a traditional classroom. This approach to research is widely criticized and is suspect. Generalizations about comparison study research are difficult.
- There are many approaches to the practice of distance education, and the techniques used (e.g., print-based correspondence versus live, two-way interactive television) are so different, that comparing them and summarizing the results is problematic.
- Much of the research in distance education has involved adult, off-campus college students, as well as highly motivated college-bound high school students. Conclusions reached with such populations may not generalize well to other populations.
- Finally, distance education is an emerging discipline that is practiced most often by non-researchers who either do not publish, or do not provide documents that "fit the mold" of traditional research.

In spite of these limitations, it is possible to draw the following tentative conclusions from the research literature. While these summary statements should be interpreted skeptically, they are supported by the literature.

- Students learning at a distance have the potential to learn just as much and as well as students taught traditionally. The factors that determine learning are the same for distant students as they are for traditional students, including student characteristics such as motivation, intelligence, level of preparation, and instructor variables such as quality of teaching, organization, and structure of the course.

- In spite of the fact that students perform as well in a distance education environment as in a traditional classroom, and appreciate the flexibility and convenience offered by distance education, students prefer the traditional classroom.

- Good distance teaching pedagogy is not fundamentally different from good traditional teaching technique. However, because of the nature of distance education and its technologies (e.g., two-way interactive television), distance educators should consider the following in order to improve their effectiveness:

A. Extensive pre-planning is necessary: teachers cannot "wing it" in distance education.

B. Structured note taking, using tools such as interactive study guides, contributes to effectiveness.

C. The use of visuals, or graphics, can have a major impact on the success of a distance education course. However, to be effective, these visuals need to be tailored to the characteristics of the particular medium, and require considerable thought and preparation "up front."

D. To be effective distance educators, teachers need proper training, both in the use of equipment, and in those techniques that have proven effective in the distance education environment. Unfortunately, opportunities for such training are rare.

Finally, the research clearly shows that distance education is an effective method for teaching and learning. Therefore, decisions about the adoption of distance education by schools or students should probably be based on considerations such as curriculum enrichment, cost effectiveness, and availability of alternative forms of instruction.

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Distance Education--Operational Issues

Introduction

"The organizational pattern and operating practices of a distance education establishment are, of course, based on the educational philosophy of that institution as well as some economic and political restrictions" (Verduin & Clark 1991, p. 166).

A well run distance education enterprise is the product of people, planning and technology. It does not happen over night nor is it bereft of problems. As the power of technology increases at rates that seem exponential in nature, the intricacies of operating distance programs on a daily basis become equally complicated (Rumble, 1992; Verduin & Clark, 1991). In any endeavor of such sizable scope it is inevitable that despite the most careful planning, issues will arise that require policies to be determined and put into place (Murgatroyd & Woudstra, 1989; Hezel, 1991; Miller, 1991).

Purpose

It is the purpose of this chapter to review operational issues related to the administration and management of distance education. For the purpose of this chapter operational issues are defined as those issues related to the administration and management of the enterprise of distance education. Of primary interest are those policies that provide a structure for successful distance education programs.

It is possible to glean, from currently available literature, a number of common issues inherent in the operation of distance education programs. These issues can be divided into 3 major categories:

* personnel
* facilities
* curriculum

Among the issues included within these categories are: training and evaluation of teachers, students, and staff; implementing and managing the technologies used; support services for teachers and students; equipping, scheduling and maintaining facilities; and making decisions about content, development and evaluation of curriculum.

This chapter will examine each of these categories and the issues within them. It will look at the decision making structure that examines the issues and develops policies designed to facilitate effective solutions.

Issues: Far Reaching Scope

Operational issues occur at all levels of distance enterprises; local, state, national and international. Telecommunications and interactive delivery systems, for example, have the capability to bring the teacher directly to distance students, shrinking their world instantly (U. S. Congress, 1989). Connectivity with the magnitude to cross oceans, borders and lines forces issues at international and national levels as well as state and local levels (Collis, Veen, & De Vries, 1993; McGreal & Simand, 1992; Davis & Elliot 1989). It is the job of the various management and administrative bodies at each of those levels to consider the issues and construct policies designed to facilitate effective solutions which must evolve in concert with political and economic policy-making agendas (Olcott, 1992; Miller, 1991; Collis, Veen & De Vries, 1993).

Management and Administration

Rumble (1992) states that the key to successful management of distance education lies in planning, organization, leadership and control. "Management is the effective utilization of human and materials resources to achieve the objectives of an enterprise. Distance education systems, because of the inherent complexity and interdependence of their parts require 'tighter' management than conventional educational institutions" (Snowden & Daniel in Sewart, Keegan & Holmberg, 1988, p. 339).

The need for "tighter" management is valid in the sense that the administrative and management units of distance enterprises

need to retain a higher degree of control and must possess a greater measure of knowledge pertaining to the inner workings of their organization than would normally be used in a non distance institution. The effective coordination of personnel at numerous levels and multiple sites requires excellent communication among all aspects of the enterprise (Davis & Elliott, 1989; Verduin & Clark, 1991).

Distance education enterprises, not unlike the highly specialized and multifaceted equipment of which they make use, are organizations with myriad interconnected parts. Each part of the distance education organization relies on excellent communications and appropriate control over the various organizational components in much the same way that the individual pieces of equipment require the smooth interconnectedness of their individual technological components in order to function at peak efficiency.

Due to the nature of their funding, the majority of distance education enterprises need to show a high degree of fiscal accountability (Snowden & Daniel in Sewart, Keegan & Holmberg, 1988; Murgatroyd & Woudstra, 1989). While price tags for the technology used in current distance systems involving computers and telecommunications networks are declining, the entry level costs for such equipment is seldom below the 6 figure mark and taxpayers, school boards, and state legislatures as well as funding agencies, both governmental and non-governmental, expect to get the most from their funds (Dede, 1990; Miller, 1991; Jones et al, 1992; U.S. Congress, 1989).

Indeed it would be highly irregular to find a distance education enterprise where some form of external funding was provided that did not require evidence that the monies were being effectively utilized. In situations such as the Mass Learn Pike where districts must buy-in to a system it would be highly unusual for participating school districts not to be concerned that fiscal accountability was a high priority of the administration and management of the distance system to which they subscribe (Miller, 1991; Davis & Elliott, 1989).

Issues pertaining to the means of visible measurement of achievement can be answered by comprehensive evaluations. Much of the evaluative procedure can be done by the management and administrative arm of the distance enterprise, however, evaluation should be done both internally and externally.

Evaluative feedback provides the mechanism by which distance education enterprises can demonstrate their effectiveness and assure the quality of the learning experiences they provide (Miller, 1991; Moore, 1989; Murgatroyd & Woudstra, 1989; U.S. Congress, 1989). Reilly & Gulliver (1992) stated:

> The distance learning experience, particularly when it involves the use of technology, cannot necessarily be evaluated by the standard measures applied to classroom education, such as seat time, amount of face-to-face contact with the instructor, and the immediate availability of massive library collections and extensive laboratory facilities. In fact, since measurement of these inputs has produced little empirical evidence of the effectiveness of conventional classroom learning, using them as the base line to evaluate distance learning is problematic as best. (p. 12)

Whether evaluations are being conducted within the distance organization or are facilitated by an external organization the criteria by which the evaluation is conducted will need to change in order to reflect the different pedagogical assumptions implicit in distance education (Granger in Reilly & Gulliver, 1992).

As distance education enterprises grow to meet the needs of their students they become increasingly complex. Technology has seen to it that education is no longer the sole territory or property of any one system, institution or governmental body (Reilly & Gulliver, 1992; U. S. Congress, 1989). The availability of information once thought of as accessible only to specific individuals or

groups is now available to anyone with the equipment and desire to explore it.

The management and administrative bodies of many of today's distance enterprises reflect the increasingly complex nature of distance education's newer technologies. They are the product of a combination of organizations blended to form a single team with each player involved in specific aspects of the enterprise. It has recently become common practice for statewide networks to be the product of cooperation among the state's governmental body, the education system, at whatever levels necessary to accomplish the stated goals of the program, and the business sector (IDEA, 1992; Hezel, 1991; U.S. Congress 1989). Among the chief issues of administration and management is the need for cooperation among and between those entities involved in distance education (Reilly & Gulliver, 1992; Hezel, 1991; Miller, 1991).

Iowa's Star School Project, the Iowa Distance Education Alliance: Partnerships for Learning through Interactive Telecommunications, is an excellent example of the cooperative ideal. This project is the result of a collaborative effort of teachers and administrators from local school districts, the Iowa Department of Education, Iowa Public Television, the community colleges, the area education agencies, and the public (regent) and independent colleges and universities, and is supported by teaching and administrative professional organizations and the state's K-12 school boards (IDEA, 1992).

The Massachusetts Corporation for Educational Telecommunications (MECT) is similar in regard to the cooperation demonstrated by the business, labor, government, education and health sectors. This body boasts a Star Schools project which was the result of a partnership which coordinated 21 program providers (Miller, 1991).

The North Dakota Interactive Video Network, a statewide multiple video conferencing system, became a reality during the 1990-91 academic year through the cooperative efforts of their state legislature, the North Dakota University System, the Department of Public Instruction, the Information Services Division, the USDA Rural Health Project, the Educational Telecommunications Council (ETC), and local school districts (Tykwinski & Poulin, 1991).

In distance enterprises where instruction is telecast across state boundaries the issues of teacher certification and institution accreditation are a major concern (Hezel, 1991; Reilly & Guliver,1992; U.S. Congress, 1989) . Reilly and Gulliver (1992) listed the need for national accreditation, as called for by the Project of Assessing Long Distance Learning via Telecommunication (project ALLTELL), among the chief administrative and management issues in distance education.

Summary

Distance education enterprises are highly complex organizations. The issues concerning distance education enterprises are as complex as the enterprises themselves. In order to be successful, distance education enterprises require a high degree of planning, management control, and excellent communications.

The scope of these issues is wide ranging. These issues can be found within grade levels K - 12 and beyond, and course offerings across the curriculum. The issues concerning distance education enterprises involve both internal and external elements of the organization, recognize no geographical boundaries and can be found to occur at the local, state-wide, national and international levels.

Within the purview of management and administration there are issues arising from:

- the necessity for detailed program evaluations across all aspects of the distance enterprise conducted both inernally and externally
- the desire for a set of nationally accepted institutional accreditation standards to

insure the quality of an education delivered at a distance

- the desire for a nationally accepted set of teacher certification standards which meet a minimum criteria including training in distance education theory and methodology

- the necessity and desirability for cooperation among the business, government, and education sectors

Personnel Issues

Successful operation of a distance enterprise requires the knowledge, talents, and cooperation of a great number of individuals. John Dodd (in Kaye & Rumble 1981) stated:

> In traditional teaching, not many people are involved in the teaching process. Teachers interact with students directly. Lecture notes are not professionally edited nor printed and distributed by others. The content of lecture notes is rarely scrutinized by academic colleagues. Teaching within the closed doors of the classroom is characteristically an individual, private activity.
>
> In distance teaching, communication between teachers and distance students is indirect. Many others - editors, designers, printers, broadcast producers, local tutor - can be involved in conveying to the student what the teacher originates. Teachers may work in production teams in which each member has an interest in what each other member is doing. With multiple learning materials being produced and many people collaborating in their production, the need to plan and coordinate staff activity is essential. (p. 85)

These individuals, from instructors to students to support staff, must work in concert to produce quality distance educational programming. Due to the interconnected nature of distance enterprises, each individual is considered a valuable and integral member of the distance education team (Cyrs & Smith, 1990; Duning, Van Kekerix, & Zaborowski, 1993; Kaye & Rumble, 1981; Verduin & Clark, 1991).

For the purpose of this discussion Personnel issues are divided into three areas: (a) teachers, (b) students, and (c) support staff. The teacher section includes issues in the areas of professional and pre-professional preparation, compensation, and support. The student section includes adult and K-12 learners and is divided into the areas of selection, preparation, support, and testing and evaluation. Support staff is divided into technical, clerical, and educational areas of expertise, and the position of facilitator / monitor. Each of these categories includes issues which must be resolved in order for the personnel of distance education enterprises to function effectively and efficiently.

Teachers

A number of critical issues concerning distance education teachers must be addressed, for while the goal of educating students has not changed, the methods of instruction require a new vision. This section includes issues which, by their very nature, may have the most far reaching impact if for no other reason than it is the teacher who teaches.

> The critical role of teachers in effective learning means that all must have training, preparation, and institutional support to successfully teach with technology....Few teachers have had either teacher education or field experiences that enable them to be effective distant teachers or successfully use technology in their own classroom. Although it is the technology that removes barriers and expands opportunities for learning, it is the teacher who teaches. In distance learning, teachers find that they are required to change their method of teaching and give more attention to advanced preparation, student interaction, visual materials, activities for independent study, and follow-up activities (U. S. Congress, 1989, p. 11).

For the purpose of this chapter we will delineate between the job responsibilities of the teacher and the facilitator / monitor. In many distance education enterprises the terms facilitator and monitor are used interchangeably, and in many cases facilitator / monitors are certified teachers. It will prove helpful, therefore, to provide a defined role for these positions.

The role of the teacher is that of delivering the instructional information to the student using some form of technology. The teacher must be certified for the appropriate grade level, possess the appropriate educational endorsements for specific subject matter, and have received training regarding effective distance education practices. The teacher is responsible for class content, design and delivery of instruction, degree of interactivity, and student evaluation at all receive sites as well as at the origination site.

The role of the facilitator / monitor is to perform functions involving operation of equipment, answering questions when necessary, distribution and collection of those materials which the teacher has chosen, assisting the course instructor when asked, and offering encouragement to remote site students.

Professional and Pre-professional Education

Effective distance education does not just happen any more than effective teachers just happen. Beaudoin (1990) stated that those faculty accustomed to more conventional teaching modes would have to acquire new skills to assume expanded roles not only to teach distance learners, but also to organize instructional resources suitable in content and format for independent study. The nature of distance education, i.e., the separation of teacher and learner, necessitates changes in the methods used for instructional delivery. Further, each technology used to deliver instruction, whether it be correspondence or interactive telecommunications, requires that modifications and enhancements be made to the traditional face-to-face methods of teaching (Cyrs & Smith, 1990; Dede, 1990).

Collis, Veen, & De Vries (1993) predict that there will be a great need for teachers and students with telecommunications literacy. In order for distance teachers to be effective they will need to participate in preparation programs designed to assist them in acquiring the necessary knowledge and skills required to function successfully in today's interactive distance education classrooms.

If those institutions which consider themselves to be at the forefront of preparing teachers for the classrooms of tomorrow wish to remain at the forefront of their profession they will need to provide their preservice and inservice teachers with the tools necessary to excel at their craft. While a large number of excellent institutions have been educating preservice and inservice teachers for decades, little has been done in the actual preparation of teachers for the world of distance education, (U.S. Congress, 1989). Even less preparation has been undertaken in the area of interactive distance delivery systems which involve telecommunications (Moore,1989; U.S. Congress, 1989; McGreal & Simand, 1992). As distance education becomes increasing prevalent throughout the world the necessity of preparation in this area of the discipline will become more acute.

Iowa is an example of a state which is making efforts to address the training issue at both the preservice and inservice levels. In a cooperative effort, as part of the state's Star Schools Proposal, the Teacher Education Alliance (TEA) which is a part of the Iowa Distance Education Alliance (IDEA), is cooperating with the state's regent institutions and private colleges and universities to provide training and support to Iowa's preservice and inservice teachers.

The TEA is producing a resource guidebook for the infusion of distance education into existing teacher education programs which is designed to assist the state's teacher education professionals in preparing preservice teachers for success in the distance education classroom. The resousce guide includes: (a) a discussion of the philosophy of distance education, (b) an infusion model, (c) a sample matrix of the process, (d) a

discussion of learner characteristics, (e) a discussion of the organization involved in distance teaching, (f) a section concerning evaluation, and (g) a section covering copyright considerations.

In addition, the TEA is involved in the presentation of staff development workshops for the state's inservice teachers. The workshops for inservice teachers cover: (a) distance teaching methodology, (b) special curriculum needs, (c) design of instructional materials used in distance teaching, (d) development of curriculum implementation strategies, and (e) training and practice in the operation of the telecommunications system used to deliver instruction over the Iowa Communications Network (ICN).

In 1989 Mansfield University in Pennsylvania was providing education students in their instructional technologies course the opportunity to use audiographics technology to teach students in Riverdale, North Dakota (U.S. Congress, 1989). The Curry School of Education at the University of Virginia created an electronic bulletin board system called Teacher-LINK to connect student teachers in the field with their university professors (Schrum, 1991). These additions to student teaching and preservice teacher education offer students valuable experience in the capabilities and possibilities of distance teaching.

Many universtites and colleges, New Mexico State University, Iowa State University, the University of Northern Iowa, North Dakota State, and Iowa's Kirkwood Community College among them, offer workshops in teleteaching for their faculty. These instutions have also developed extensive resource guidebooks to be used in preparing their faculty for successful distance teaching experiences (Cyrs & Smith, 1990); Graf, 1993; Tykwinski & Poulin, 1991). Such guidebooks typically include sections on distance teaching philosophy and methodology, audience characteristics, course and materials design, and technology operation and capability.

Where distance education courses cross state lines the certification of teachers becomes an issue (Hezel, 1991). The delivery of distance education would be greatly facilitated if states could reach a consensus related to the minimum standards which are required by those instructors teaching via telecommunications technology (U.S. Congress, 1989; Reilly & Gulliver, 1992).

Compensation Increasing demands are placed on instructors' time. Distance teachers need additional planning time and must adapt current materials or develop new ones with consideration for a new set of criteria (U.S. Congress, 1989; Cyrs & Smith, 1990; Graf, 1993). Issues concerning the ratio of planning time to teaching time will bear certain scrutiny and require implementation of policy as increasing numbers of teachers begin delivering instruction to students at a distance.

Where school districts participate in multiple site distance education delivery systems, issues pertaining to the sharing of teachers and their classes must be considered. Many of these issues are inherently local and need to be resolved between or among participating districts.

McGreal & Simand (1992) discussed the difficulties faced by Northern Ontario school districts attempting to use a cooperative model for distance education courses involving the sharing of services among several secondary schools. The authors pointed out that finding a mechanism for releasing the distance teachers, justifying small class sizes, and coordinating school calendars and teachers' schedules became a very complicated proceedure. The authors found that when districts were attempting to form groups of more than three schools, problems increased exponentially. Their experience indicated that even groups of three were difficult to hold together.

Sachs, Wilkinson & Murphy (1993) described a highly successful instructor sharing agreement involving the campuses of the Virginia Community College System (VCCS). To facilitate the sharing of instructors the VCCS campuses which were receiving classes added each distance instructor as an adjunct faculty member.

Each receive site campus collected enrollment fees from their students and paid an instructional delivery fee to the origination site campus. The origination site campus was solely responsible for paying the distance instructor.

Distance education is in a uniqe position to provide continuing education for inservice teachers. Districts which provide funds for the continuing education of their teachers and have distance education infrastructures in place will be able to provide those additional credits in a more cost effective manner. Travel time and expenses can be significantly reduced for teachers opting to take classes at a distance (Jurascek, 1993). Available courses are many and varied, offering educators across the nation opportunities to expand their knowledge base and create personal information networks.

However, questions of funding parity become evident as one moves from wealthy, influential districts, or those receiving substantial government funding, to those districts at the opposite end of the socio-economic and political spectrum.

> In this fee-for-service course delivery model, the users' fee justifies for the delivering board the outlay or resources. The receiving boards can participate in the courses as needed and opt only for courses that they cannot deliver locally. Unfortunately, it is often the smallest schools, those that need the courses most, that can least afford to pay for the courses; they need all their funds to maintain their in-school programs (McGreal & Simand, 1992, p. 58).

Depending on the availability of funds and the weight or importance assigned to distance education and its accompanying technology, money can be freed to defray all or part of the costs incurred by teachers who desire to participate in workshops and inservice programs concerning distance education (Willis, 1989). Policy needs to be designed to address equity of training opportunities for teachers already in the field.

Support Administrative and fiscal support for teachers will be required (U. S. Congress, 1989). Moore (1989) pointed out that in addition to appropriate training it was crucial for professional distance educators to receive administrative support that reflected a belief in the importance of efforts to become effective teachers-at-a-distance. He suggested that this could be accomplished by assurances of job security, salary and time allocations, and by including teachers in the areas of planning and decision making. Providing faculty with well maintained equipment and opportunities to become familiar with the technology, and staff development are equally important.

Students

It is traditional to think of adult learners when distance education is mentioned (Garrison, 1989). Indeed, the greatest percentage of distance students have been adults. Whole institutions of higher learning such as Athabasca University in Canada or Great Britain's Open University are dedicated to providing distance education at the post-secondary level.

That tradition is changing. With the implementation of well funded programs, such as the U.S. Federal government's Star Schools Program, the vast possibilities of distance learning are being increasingly offered to K - 12 student populations as well as traditionally underserved populations (Miller, 1991; IDEA, 1993). High schools, middle schools, and even elementary schools are being offered opportunities to experience the wonder and power of today's high technology distance education.

Selection Traditionally distance students have been adults who voluntarily sought further education for a variety of reasons (Garrison, 1989). These students enrolled in educational programs which fit their individual needs and situations. Entrance to these programs was determined by the individual institution offering the course work. However, distance education is becoming a growing method for providing increased professional development. These corporate students are frequently selected for specific training by their superiors.

The major change in the distance educated student body is in the influx of classes being offered for students in grades K -12. At the elementary and middle school levels distance education, primarily in the form of telecommunications, is used as a method of curriculum enrichment. However, the impetus for distance learning at the secondary level is due primarily to the needs of small rural school districts (U.S. Congress, 1989). In some cases students enroll in courses to meet graduation requirements which their own districts are unable to offer. Other students opt to enroll in course work because they posses an interest in the subject or need the class for a college entrance requirement (Corporation for Public Broadcasting, 1993).

In many instances high school level students have been selected to attend distance classes by virtue of their high academic ability and specific learner characteristics, as is often the case with those students who have been labeled talented and gifted (U.S. Congress, 1989). At the other end of the spectrum are federally funded projects such as the Star Schools Programs whose goals include serving students and schools which are considered educationally disadvantaged or traditionally underserved (U.S. Congress, 1989; IDEA, 1993; Miller, 1991; Rumble, 1992).

Preparation Today's distance students can no longer be characterized by the sweeping generalities of the past. In an educational climate permeated by individualization, which distance education has always considered as one of its strengths, distance education is opening opportunities to whole classrooms of students.

Fiber optic technology makes it possible to place a teacher in real time both visually and auditorially within the receive site classroom; a technique referred to by one author as the next best thing to being there. Issues mentioned by Holmberg (1986) concerning the amount of individualization, student autonomy and opportunity for interaction become moot with the instructor "in-site". However, new issues arise to take their place.

Among those issues is the provision for a program of student orientation regarding the distance education experience (Moore, 1989). Students benefit from being informed about the rules and procedures of their distance class and the expectations of their instructor. Programs and personnel must exist that can explain and demonstrate the distance technology in those classrooms where some pieces of equipment, such as microphones, must be operated by students.

Support Appropriately designed and maintained support systems are a requirement for successful distance enterprises (Moore, 1989) Methods for accessing out of class materials, such as those provided by individual school media centers or local libraries, should be taken into consideration. For example, distance classes requiring specific laboratory facilities, such as a class in photography or computer programming, need to assist students in making the necessary arrangements for use of local facilities, either at the student's home school or in the local community, that can provide comparable experiences to those in their classes. If facilities are not locally available, arrangements should be made for student use of the facilities at the origination site.

Accessibility of the distance instructor is an important support issue. Students need to be apprised of the ways they can reach their teachers (Duning, Van Kekerix, & Zaborowski, 1993; Moore, 1989). This is usually done through the use of long distance phone calls or fax machine, however a block of time on the system could be provided at each site during a specific day when the instructor and student could "meet" via the technology. Trips by the instructor to the distance site as well as trips by the student to visit the instructor at the send site are also possibilities. Instructors need to provide their distance students with timely feedback concerning assignments and tests. Students must be constantly provided with opportunities to interact with their instructor, and fellow students at all participating sites and outside the distance classroom.

Distance students are separated from their instructor, classmates and the other personnel often associated with learning institutions. When problems occur these feelings of separation may become heightened. It is necessary, therefore, to provide distance students with counseling services that understand the special needs of distance students (Moore, 1989: U.S. Congress, 1989; Rumble, 1992).

Testing and Evaluation The term evaluation means many things to many people. In one form or another, evaluation is used in every kind of formal education (Verduin & Clark, 1991). It is important for students to participate in the evaluative process both in terms of their own progress and the success of the programs in which they participate.

Research shows that participant evaluation is one ot the best indicators of the effectiveness of a program (Sachs, 1993). Student feedback can provide valuable data on which to base decisions regarding course effectiveness (Sachs, 1993; Johnson, 1988; Martin & Rainey, 1993). Once analyzed, assessments of student attitudes and perceptions can be used to identify and change those areas of a program that are found to produce negative reactions (Biner, 1993; Egan, Welch, Page & Sebastian, 1992).

Cyrs & Smith (1990) indicate that the purpose of student assessment either through observable performance, product development or traditional paper and pencil tests is to provide data to the instructor indicating to what degree the performance objectives have been mastered. Individual testing over course material is an important diagnostic tool for the student and the teacher. Students should be given timely feedback on the examinations they take in their distance classes (Duning, Van Kekerix, & Zaborowski, 1993).

Support Staff

Distance education enterprises are characterized by the integration of a great many parts working toward a common goal. Support personnel, clerical, technical, and educational, are a vital link between teacher and student. Support staff provide a great deal of the services used by distance students.

Technical personnel The focus on technologically advanced telecommunications systems as the method of delivery of distance education necessitates a staff of well trained individuals. In some distance classrooms the technology that delivers the picture and sound to the remote sites is run by a technician rather than the distance teacher. School district remote sites with large investments in advanced technology require access to the services of local technical support personnel.

Clerical personnel Clerical personnel handle enrollment and registration of students, process requests for equipment repair and acquisition, handle collection of tuition, maintain lines of communication between and among the various teams involved in distance enterprises, and frequently assist in the replication and distribution of course materials. As a main factor in the service oriented arm of a distance enterprise these individuals have a great deal of contact with distance students. When handling routine student transactions on a daily basis, friendliness and a helpful attitude make support staff a critical link between the student and the enterprise.

Educational personnel A number of issues surround the role of the facilitator / monitor. Policies differ from state to state as to whether or not the facilitator / monitor must be present at the receive site during the entire class period or simply accessible to students if and when they require assistance. States also vary widely on the specific qualifications required for this position. The necessity for current teaching certification for facilitators is directly affected by the way in which individual states interpret their policies governing the use of distance site facilitators. Training in effective distance practices may also be required depending upon the state.

The state of Washington requires classroom facilitators to be certified in the subject being

taught. States such as Alaska and Oregon require the presence of certified teachers, however endorsement for specific subject matter is not considered necessary (US. Congress 1989). The most current revision in the Iowa Code Chapter 15, "Use of Telecommunication for Instruction by Schools" 281-15.5(256) Teacher preparation and accessibility reads,

> A teacher appropriately licensed and endorsed for the educational level and content area being taught shall be present and responsible for the instructional program at the receiving site if a presentor of material transmitted via telecommunications is not an appropirately licensed and endorsed teacher for the educational level and content area. If a presentor of material transmitted via telecommunications is an appropriately licensed and endorsed teacher for the educational level and content area, a supervising teacher, or aide to whom a supervising teacher is readily available for consultation, shall supervise and monitor the curriculum and students, and be readily accessible to the students. Prior to being assigned initially to deliver instruction via telecommunications, a teacher shall receive training regarding effective practices which enhance learning by telecommunications." (Iowa Departmen of Education, 1993).

Programming Issues

Courses

Distance education courses are designed to accommodate vast and varied segments of the population including business, professional organizations, government, and education. Courses are offered in a multitude of subjects across the curriculum and more recently across grade levels, spanning everything from pre-school to post-secondary education. Programming is available in every possible media from print to live, two-way full motion interactive video. Classes are available locally, regionally, nationally, and internationally.

The issue is no longer so much a profound concern over programming subject availability, accessibility, or cost, but one of quality. Hezel (1991) points to educational value as being an important consideration in a program or course. In looking for programming to suit the needs of a particular group of learners it becomes imperative to look beyond the titles and price tags. School districts have little money to waste on programming that is pedagogically unsound, poorly designed, or unsuitable to their specific needs.

Miller (1991), discussing distance education, states that there are no national guidelines or articulated standards for academic courses, and further that there are no generally accepted criteria or review panels for instructional design and delivery. Such a lack of policy concerning distance programming surrounds this area of concern with the distinct air of caveat emptor.

Course design and curriculum development are critical to any educational endeavor, but the special parameters presented by distance education make this area particularly important (Moore, 1989; Graf, 1993). In a large dedicated distance education enterprise the personnel required for course and curriculum design can be numerous. Verduin and Clark, (1991) stated,

> The development of learning materials and media is particularly critical in distance education and could be approached by a team with a good degree of sophistication. The development team should include content specialists (academics); instructional designers; writers and editors; media specialists, if different from designers; and specialists in adult learner behavior and curriculum development. An interactive team approach can minimize the production-line concept, in which people add bits and pieces to courses as they come down the line. Course development is a highly skilled area of expertise and should be treated as such to ensure quality control of the program. (p. 177)

Depending upon the size of the distance enterprise and the level at which the course is

taught, the content of the material and the extent of the production will vary. Dedicated distance universities such as Great Britain's Open University require vast design and production services. Programming originating from a single instructor in an Iowa high school may simply need to be adapted to the specific delivery format which will be used.

There are currently a number of privately and commercially produced shows available. Programs produced for the lower elementary level, like "Reading Rainbow", delight students and teachers alike. Current events programming such as The Discovery Channel's "Assignment Discovery", Cable News Network's (CNN) production "CNN Newsroom", and Whittle Communication's "Channel One" provide older students with excellent news coverage. Such programming is not without its pitfalls however. In the case of "Channel One" there is advertising to consider and this has become a controversial issue in the educational community (U.S. Congress, 1989; Miller 1991).

Intellectual property rights of faculty and questions concerning faculty royalties will need to be addressed (Hezel, 1991; Miller, 1991). Programming copyright policies must be fashioned that are equitable to the developer without pricing the product beyond the means of the distance enterprise. Marketing the instructional programming available from various distance institutions will need to be addressed (Moore 1989; Rumble, 1992).

Programming control is a vital issue. Miller (1991) points to MCET's Star School proposal as an example of making an attempt to accommodate local autonomy by presenting an array of available programs and technologies and assisting local schools in making the most suitable choices. It is an important consideration to local communities to be able to retain control over the programming they use (Miller, 1991; IDEA, 1993; McGreal & Simand, 1992)

Enrichment

One of the advantages of distance education, particularly in the area of telecommunications, is the multitude of ways in which it can be used to enrich the curriculum. Through the use of current technology it is possible to bring experiences into the classroom that were only dreamed of a few years ago.

Children in a sixth grade social studies class writing to pen-pals in a foreign country are able to converse with their fellow students face-to-face via telecommunications. Students in a high school civics class studying famous speeches from national political conventions could talk with individuals who have delivered such addresses. Students in a foreign language classroom can exchange in lively conversation directly with their counterparts in a classroom in Spain. Recently 15 sites in Iowa participated in special All State instrumental music lessons where high school students across Iowa were given the opportunity to learn and interact with experts in the fields of brass, reeds and percussion. As part of the education process student teachers from several universities across the nation can gather to discuss the first several weeks of their teaching experience.

Facilities Issues

Equipment and Maintenance

Technology that is new today is old tomorrow. Computer and telecommunications equipment undergo changes in capability with such speed that some of the technology becomes obsolete almost before it is operational (Miller, 1991). When the concerns of obsolescence are coupled with the rate at which technology drops in price and the issues of which technology to buy and how much should be purchased, it is clear that there are difficult questions for distance enterprises and school districts to answer (Dede, 1990; U.S. Congress, 1989).

The amount and sophistication of the equipment needed for a distance education enterprise depends on the chosen method of delivery, or the type of system to which one subscribes. Each enterprise is organized and funded differently. Equity in the distribution of funding is a concern (McGreal & Simand, 1992). The purchase of equipment is usually centrally done so that equipment can be purchased in volume which is more cost effective.

Space for distance classrooms becomes an issue particularly in overcrowded districts. Lack of an adequate site for a distance classroom could mean a lack of participation in a distance project and would have to be carefully weighed against the commotion created by displacing and subsequently redistributing students in order to gain the required space. Consideration must be given to equipping interactive distance classrooms in the most unobtrusive way possible. The learning, not the technology, should be the primary focus of what transpires in the distance education classroom (Miller, 1991).

Maintenance of interactive distance classrooms is generally taken for granted, but left undone, this aspect of a distance classroom could well be the most glaring weakness. The majority of complaints from distance students concerning telecourses relate to the quality of the transmissions (Cyrs & Smith, 1990; Jurasek, 1993).

Scheduling

Assessments of the needs of distance students can help determine which courses to schedule during a semester; however, when classes are telecast to multiple sites, the problems associated with scheduling multiply rapidly. Schedules need to be synchronized between and among participating districts not only in regard to their daily calendar but the yearly calendar as well (McGreal & Simand, 1992).

Policy must be formulated regarding issues of scheduling conflicts. A criterion for resolving those conflicts should be established and a position among the personnel of the distance enterprise should be designated to make those kinds of decisions. In Iowa, when scheduling conflicts on the Iowa Communications Network cannot be resolved at the regional level, the matter is turned over to the Narrowcast Advisory Committee (NAC) which renders a resolution.

Class size is an issue that can affect course offerings. Some districts simply cannot afford to commit a classroom or the services of a distance teacher for one period each day for an entire semester for a very small number of students (McGreal & Simand, 1992). Conversely, extremely large numbers of students as well as large numbers of multiple sites make distance classes undesirable because the amount of interactivity is severely curtailed (U.S. Congress, 1989).

In an effort to reach out to community interests and make distance education available to populations which are not a part of the traditional academic setting, distance sites located in school buildings must make an effort to remain accessible during the hours when classes are not in session. Conversely, those distance sites which are located in places other than the tradional educational setting need to be sensitive to the needs of the educational community. Clearly, such awareness can build invaluable partnerships which will enrich all involved.

Summary

This chapter has discussed issues pertaining to the organization and operation of distance education enterprises. As distance education enterprises break through the barriers of traditional classroom walls they encounter new barriers with which they must contend. If distance classrooms are to become places of learning excellence the issues which erect new barriers will need to be addressed.

Distance education literature dealing with policy issues can be summarized as follows:

1.) To be successful distance educators, preservice and inservice teachers

require additional training appropriate to their mission.

2.) Delivery of distance education courses spanning state boundaries will be greatly facilitated by a nationally agreed upon set of standards.

3.) Administrative and fiscal support for distance teachers is required and can be demonstrated by providing for staff development and increased planning time, inclusion in the policy planning proceedure, job security, and well maintained equipment.

4.) Inequities in funding of programs for staff development and student programming must be addressed.

5.) Sharing of instructors and scheduling of courses between or among school systems requires meticulous planning.

6.) Students must be provided with support services including orientation and counseling appropriate to their grade level and course of study.

7.) Testing and evaluation of both student performance and program effectiveness are necessary and such feedback should be expeditious.

8.) Programming, while widely available in many formats, curriculum areas, and grade levels does not necessarily meet a minimum standard of excellence and should be judged accordingly.

9.) There are a plethora of technologies available for the delivery of distance education. However, compatibility, cost, and longevity of equipment require careful consideration and planning prior to purchase and installation.

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ISBN 0-89240-071-4

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